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Annual Report of the

NEW YORK ZOOLOGICAL SOCIETY

1962

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NEW YORK ZOOLOGICAL SOCIETY

SIXTY-SEVENTH ANNUAL REPORT

1962

THE SOCIETY'S OFFICES
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THE ZOOLOGICAL SOCIETY IN 1962

FAIRFIELD OSBORN, *President*

IT IS FREQUENTLY a temptation to look upon the year just passed as one of special significance. In the case of our institution, considering the variety of its activities, it is true that no year passes without some exceptional development. However, measured against the past, the year 1962 does stand out preeminently in several respects and represents a turning point.

The principal reason that justifies this statement is that good progress has been made in the campaign to acquire funds with which to carry out the General Development Program at both the Zoological Park and the Aquarium and to strengthen the Society's financial position in order to enable it to step up its work in scientific research and wildlife protection.

It was reported in the previous Annual Report that contributions and pledges totalling $1,139,763 were on hand. During the year 1962 another $1,255,389 has been received so that there is now a total of $2,395,152 contributed and pledged toward the General Development Program. It will be recalled that the goal of the campaign for funds from independent sources—individuals, foundations and corporations—is $5,125,000. Presently, therefore, the Society has on hand almost half of the amount we are striving for. It will be further recalled that it is anticipated the City of New York will be prepared to match, dollar for dollar, the monies to be provided by the Society for the physical development program of the Zoological Park and the Aquarium. In this regard, the situation is distinctly encouraging in that the City has formally approved the entire program for new buildings and exhibits at the Zoological Park and during the year the Board of Estimate appropriated matching funds required for initial designs and plans. Details of the modernization program will be described, from time to time, in the Society's magazine, *Animal Kingdom.*

A partnership between the Government of the City of New York and a cultural and educational institution such as ours is a highly gratifying example of the values of the joint use of public and private funds.

Another aspect of such cooperation is the action taken by the City of New York in regard to the operating costs of the Aquarium. At mid-year the Board of Estimate appropriated funds to meet the salaries of some of the operating personnel. This action has gone a long way towards placing the Aquarium on a satisfactory operating basis. As a result, the deficit for the year was reduced to $21,825—a figure substantially less than that of previous years. It should be added that public attendance, on a paid admission basis, is increasing steadily.

MEMBERSHIP

The steady increase in the number of the Society's members continues to be encouraging. Membership has reached a new high of 4,316 individuals with annual dues totalling $77,432.

FINANCES

Operating income from invested capital, membership dues and other miscellaneous sources amounted to $486,481. In addition, the City of New York provided $1,065,315 towards the operating costs of the Zoological Park. Society expenses, paid from private funds of the Society, totalled $505,474, resulting in a deficit of $18,993. In view of the general rise of operating costs so common to every organization these days, it is a matter of at least some satisfaction that the deficit was held to that amount. It is obvious that the capital funds of the Society must be substantially increased so as to avoid deficits of a magnitude that might undermine the general financial strength of the Society.

The support accorded the Society's work in scientific research is especially gratifying. Grants from governmental and other sources, together with pledges, aggregated $709,240, a substantial increase over previous years. The principal item in this increase is the support that has been pledged for the new Marine Biological Laboratory to be built at the Aquarium. It is hoped that the grant from the National Advisory Council on Health Research Facilities in the amount of $623,500 to meet half the cost of the proposed laboratories will be confirmed out of congressional appropriations to be made for the year beginning July 1, 1963. Among the pledges is one in the amount of $250,000, to be used to match the funds that may be provided by the federal government, from the Health Research Council of the City of New York. Additional pledges of $60,000 are on hand for this purpose and these, together with an allocation from the General Development Fund, will enable the Society to match the anticipated federal grant. A highly encouraging grant is that of the John A. Hartford Foundation, Inc., in the amount of $266,400 for the advancement of research in marine biochemistry.

Other funds received, through legacies and gifts, amount to $143,000.

PENSION AND WELFARE COSTS

A Cultural Institution Retirement System was announced by the Mayor early in the year. This program is designed to provide pensions and life insurance for the employees of the cultural institutions towards which the City contributes operating funds.

The Zoological Society, together with the Metropolitan Museum of Art, the American Museum of Natural History and the Brooklyn Botanic Gardens, have pension funds and insurance plans that have been established with great effort over a period of years. Presently these four institutions are not being accepted as constituent members of the newly created City System. In contrast, seven other organizations listed as among the cultural institutions of New York do not have such established pension funds, and, according to present arrangements, will gain the benefits that it is anticipated will flow from the new proposed cultural institution retirement system.

This situation seems distinctly inequitable and is one we believe must be corrected. The Society's welfare benefit costs have increased from a little more than one-eighth of its annual expenditures in 1953, to almost one-fourth of such expenditures in 1962. Consequently, this considerable portion of annual income is being diverted from the Society's urgently needed work in education and scientific research.

TROPICAL RESEARCH DEPARTMENT

The death of William Beebe, the founder of this Department, occurred on June 4, 1962. It marked the close of a career of extraordinary accomplishment. His intimate association with the Society extended over a period of 63 years. In 1949 he selected an area in the Arima Valley of Trinidad as the ideal location for the Society's permanent tropical research station. His judgment has been fully justified and during the year, as in previous ones, a number of scientists both from this country and abroad took advantage of the facilities and opportunities available at what is now known as "The William Beebe Tropical Research Station." It is peculiarly fitting that this research center should be identified with Dr. Beebe's name. He had originally purchased the property with his own funds and subsequently, through a loyal and generous devotion to the institution he served, made a gift of the property to the Society in whose possession it now lies.

The directorship of the Department has been assigned to Miss Jocelyn Crane, who for many years has been intimately associated with the Department's activities and has accomplished much brilliant work in advancing its purposes.

Wildlife Protection

The work in this field has been carried forward actively with especial attention being paid to wildlife protection in East Africa. All in all, the situation there is somewhat improved. The steps being taken by the recently-independent government of Tanganyika for the maintenance and development of the National Parks in that country are of special note and set a pattern which, one can hope, will become more common throughout the continent.

The Society's work in Africa has been purposefully diversified:

A mission was sent to Africa in January, the costs of which were met by the African Wildlife Fund. This mission was headed by one of the Society's members, Mr. Royal Little, and also included Dr. A. Starker Leopold of the University of California, Mr. D. Reid Weedon, an officer of Arthur D. Little, Inc., and Messrs. John S. McLaughlin and Thomas C. Vint of the National Parks Service. The resulting report, prepared by Arthur D. Little, Inc., dealing with the desirability of building up tourism in the National Parks as a stimulus for wildlife conservation, was presented to the Government of Tanganyika. The Society also contributed to the purchase of a portion of land required for the new National Park, Momella, in Tanganyika; contributed to the costs of new water sources for wild animals in Kenya and Tanganyika; supported research studies in wildlife ecology, including a two-year pledge of $7,500 towards the study of elephants in Uganda now under way under the direction of Dr. Irven Buss, Professor of Zoology at Washington State University.

Finally, the Society has devoted particular effort to the creation of educational programs in order to encourage understanding among the African people themselves of the extraordinary value of their wildlife heritages. This work is being carried out with notable success by Mr. William Eddy.

Contributions to the African Wildlife Fund during the year totalled $49,653 and expenditures from this Fund, combined with funds from other conservation accounts of the Society, totalled $51,176.

The Society is also taking an interest in the protection of large mammalian predators in our own country, such as grizzly bear, mountain lion and wolf. Together with the Boone & Crockett Club, we are presently financing an initial survey by Dr. Victor Cahalane of the present status of these species in the continental United States. This report will be available in the coming year and, it is hoped, will contribute to programs for the long-term protection of these remarkable animals.

TRUSTEES AND STAFF

A sad loss was suffered through the death of Eugene Holman who had served as a member of the Board of Trustees since November 17, 1942.

July 5, 1962, was a historic occasion in that it marked the termination of fifty years of active service for the Society by Dr. John Tee-Van. His career was in many respects extraordinary, commencing as a boy at the age of 14 as a helper in the Bird Department, subsequently 25 years in field work with Dr. William Beebe, culminating with more than 20 years of administrative responsibility. Upon his retirement Dr. Tee-Van was General Director of the New York Zoological Park and the New York Aquarium. He is now devoting his time to the collation of material concerning the scientific work of Dr. Beebe.

The following staff appointments were made: Walter Lerchenfeld, Assistant Comptroller, commencing June 19, 1962; Peter Ames, Assistant Curator of Birds, commencing September 1, 1962.

* * *

The present time, as mentioned above, can with justification be thought of as a turning point for the Society. New conceptions and techniques are evolving as to the maintenance of wild animals in captivity. These have to do not only with the contentment and welfare of the animals themselves but also with the values of zoos and public aquariums as places of beauty and good taste, and as centers of education in the wonders of nature so dynamically evidenced through animal life.

New fields of research are revealing themselves, providing virtually unexplored possibilities for scientific inquiry—such as the notable program in marine biochemistry and ecology in which the Society is now becoming actively engaged, or, by contrast, the studies of evolutionary processes now going on at the Tropical Research Station in Trinidad or, in turn, the advancement of knowledge regarding animal behavior which, among other consequences, may lead to a better understanding of the motivations in human psychology.

Finally, there is an ever-increasing need for extensive programs of wildlife protection both at home and abroad, since the crisis is becoming more acute and there is no limit to the role that the Society must play in helping to resolve it.

Meanwhile, our organization is at a high pitch of efficiency, eager for the accomplishments that are bound to ensue if we can reach the goal of our Development Fund Campaign.

THE ZOOLOGICAL PARK

THE DIRECTOR'S REPORT

William G. Conway, *Director*

A cultural institution can never afford to become static and the Zoological Park is in no danger of doing so. While its continued value depends upon success in satisfying new needs for knowledge and recreation and in keeping abreast of new standards of excellence, its new development program, outlined in last year's *Annual Report*, promises to provide vigorous and exciting answers to future Zoo reassessments. Educational and social pressures as well as new population "markets" seem to have culminated, quite suddenly, in a demand climate at our Zoo which may not have been equalled since its opening 63 years ago.

The increasing expansion of city as opposed to rural populations—in particular the incredible population growth in the New York area—presents peculiar obligations. Generations are growing up without *any* natural contact with wild creatures; a new public opinion concerning wildlife and wild environment is arising unfettered and unguided by fact or experience. Except at the Zoo, the opportunities to know or even become interested in wild creatures are largely vicarious ones for many city dwellers. The opinions of these people will shape the future of wild lands and wild creatures.

The type of education offered by the Zoo is not that of the classroom. While our exhibits support the departmentalized presentations of contemporary wildlife by schools and colleges, we are especially concerned with developing concepts of the whole—with the synthesis of ideas. Hence we plan to develop more zoogeographic group displays—Africa and South America, for example. We are building or planning exhibits dealing with the concept of habitat and niche, such as the Aquatic Birds Building, and a Nocturnal House that is not restricted to nocturnal mammals but is actually a "World of Darkness" concerned with dark-active mammals, birds, reptiles and amphibians.

It is, after all, not simply the amassing of a thousand species of animals which makes the Zoological Park of value, but the way this extraordinary collection is interpreted to the zoo visitor. This interpretation distinguishes a good zoological park from a menagerie, a circus or a freak show. In search of ways to expand and improve interpretations, the Zoological Society long ago established a Department of Education. Every year this Department gives hundreds of lectures, illustrated with live animals, to thousands of students in schools and colleges. A special course is given to New York City's school teachers, radio and television appearances are regularly scheduled and scores of guided tours are given at the Zoo. Unfortunately, the Education Department is far too small and is unable to realize one-twentieth of its opportunity. The expansion of our visual education efforts, the opportunity to produce regular Zoo television programs, the daily presentation of educational lectures and regular guided tours are superb but unrealized Zoo opportunities. While the fulfillment of most of these interpretive obligations must await increased financial support and new installations, two recent educational and revenue-producing facilities have proved popular. Twenty-seven thousand six hundred keys were purchased by visitors in 1962 for the Talking Labels introduced late in 1961, countless additional keys were made available at no charge to school groups and some seventy thousand Zoo-goers took educational lecture tours on the Zoo's equipped-for-sound "Tiger Trains" initiated last spring.

Curatorial efforts at interpretive display included the creation of a number of new illustrative educational signs and the development of many new habitat exhibits. Displays of species endangered in the wild were marked with special "Endangered Species" labels keyed to eye-catching "Dead as a Dodo" signs. Curiously, we appear to be the first zoo to call attention to vanishing species. Too often, perhaps, we call attention to the wonders of wild animal ways and too seldom to the contemporary relationship of wild animals and man.

Unfortunately, many of the wild species now seriously diminished in nature are the largest, the most interesting or the most spectacular forms. As a matter of practicality, the difficulties of obtaining certain species important to the Zoo's exhibits are fast becoming insurmountable, so that in point of conservation and exhibition policy, self-perpetuating breeding herds have become imperative. In the past, for example, we have displayed single or paired representatives of as many as two dozen species of antelope. We recognize, of course, that the space requirements of future large breeding herds will prohibit the exhibition of more than a dozen of the most interesting forms. While these large groups necessary to preserve the variety of available genetic characteristics and to insure the vigor of future stocks will present less diversity, large breeding groups will present far more active, natural displays and more abundant research opportunities.

In brief, we plan to show fewer kinds of animals, show those we have in breeding groups and show them better and more interpretively.

Some zoos, in years past, jealously retained very rare single animals to enhance their collection's prestige. The species and the zoos would have been better served by grouping such rare forms in a single institution for breeding purposes. In this spirit a number of single rare animals were sent to breeding herds elsewhere during the year and space was released for the expansion of our own breeding herds. Careful plans have been laid for our breeding programs. Diverse spectacular species have been chosen and the purchase of specimens is under way. Blesbok, Gemsbok, and White-tailed Gnu are antelopes already acquired for this program in 1962.

The size and diversity of the collections—1,108 species, 2,813 specimens—are undiminished despite the selection involved in the orientation of the collection toward more meaningful exhibits. Breeding success has been good; the births of a Malayan Mouse Deer fawn and a Masai Giraffe are noteworthy. A number of births and hatchings occurred in the Reptile Department and the breeding program of the Bird Department resulted in a deluge of some 1,600 eggs. Weekly animal management meetings have been developed to improve scientific animal care procedures and communication. They are conducted by the Director and the Veterinarian.

In June a brief "Report on the Scientific Work of the Zoological Society" was published as an insert in *Animal Kingdom.* We are sorely troubled by the minor role the Society's basic institution, the Zoo, with its unexcelled research opportunity, plays in this work. The operational demands of the collections leave our five scientific staff members very little time for other than "practical" research and observational work. It is hoped that a Director of Research can be added to the curatorial staff in the future.

The year's animal acquisitions were punctuated by three outstanding events: Dr. Dowling's expedition to the Galapagos Islands, which though primarily a scientific investigation, yielded Galapagos tortoises and land and marine iguanas; the arrival of two Square-lipped Rhinoceroses from Zululand; and the arrival of four Birds of Paradise. Three losses of long-time Zoo residents, known to thousands of New Yorkers, marred the year. They were "Teddy," a South American Tortoise presented to us in 1914 by President Theodore Roosevelt; "Bessie," the Indian Rhinoceros acquired from Frank Buck in 1923, and "Sudana," our 9,600-pound female African Elephant which came to the Zoo in 1931.

The completion of so many Zoo improvements during 1962 is, in large measure, a reflection of the efficiency of our Superintendent of Operations and his staff. The Animal Nursery in the Children's Zoo, designed by Architects Goldstone & Dearborn, and a gift from private donors, is an unusual and effective building. It was completed by outside contractors and Zoo forces on May 14 and has become very popular. Work on the new exhibit building for Aquatic Birds, financed as a joint City and Society Capital Budget project, began in August. The building's new displays will be striking, even experimental, and renovation of the entire surrounding system of outside exhibits including the great Flying Cage has been undertaken by our own Maintenance and Construction Department. Under the City Capital Budget Program, a new heating system was installed in the Lion House and our own forces completed an interior renovation of the Animal Hospital and remodeled the Panda Moat for the exhibition of Galapagos animals. The planting and landscaping program was increased in size and scope.

These improvements and the many noted in the Departmental Reports are gratifying; the promise of the new displays planned in our great Development Program is especially exciting, yet there remains a supporting area where demands cannot be long denied. The Zoo's basic electrical and, especially, its sewer services are seriously underdeveloped. Our Service Yard with its construction and maintenance shops has become increasingly inadequate in some areas and storage space is badly needed. Most serious is our woefully inadequate facility for the handling and storage of food for the animal collection. The construction of a modern animal commissary comparable to those in other major zoos is long overdue.

Sound business practices in the conduct of our affairs and, in particular, in the operation of our revenue-producing facilities have produced good income for Zoo improvement and animal purchase during 1962. However, major improvements to the "facilities" themselves, such as that now planned for the Zoobar Restaurant (where an unsuccessful operation is being changed) and plans for other high-priority animal quarters promise to tie up facilities earnings for some time. The inability of the City to allow us to fill vacancies during the fall has made our work force less responsive to need. Reduced work forces must concentrate on an attempt to maintain the *status quo* and improvements may not be prosecuted—inevitably maintenance falters. Our attempt to effect new and relatively maintenance-free Zoo improvements depends largely on admissions and facilities income and it may be that a reconsideration of admissions policy is indicated.

Under the supervision of Personnel Manager John McKew, the

Zoological Park's labor relations have been uneventful during the year. Formalization and revision of personnel policy have proceeded smoothly but, in particular, improvements in hiring procedures and sources promise to pay long-term benefits to Zoo operation.

The contributions and achievements of department heads and of the members of our scientific staff are recorded, in some measure, by our publications and reports—for their functions are relatively circumscribed. The Zoo contributions of Dr. John Tee-Van, who retired as General Director on July 5, are too broad and even too numerous to lend themselves to this sort of publication—except to note that the departmental records of achievement have been dependent upon him. Very fortunately, he continues to work in the Zoo laboratory of the Department of Tropical Research and continues to render his invaluable advice.

ZOOLOGICAL PARK COMBINED CENSUS

December 31, 1962

	Species & Subspecies	*Specimens*
Mammals	204	588
Birds	646	1,533
Amphibians and Reptiles	258	692
Totals	1,108	2,813

SUMMARY OF ATTENDANCE

	Zoological Park		*Aquarium*	
Month	*1961*	*1962*	*1961*	*1962*
January	31,077	45,211	7,500	9,958
February	49,177	46,720	7,870	13,578
March	154,240	160,996	14,522	22,376
April	664*	287,336	—*	34,392
May	219,225	362,097	12,221	39,339
June	380,048	316,985	40,392	49,404
July	402,982	431,265	41,551	71,705
August	357,752	388,613	43,864	69,582
September	225,003	243,727	17,497	24,257
October	168,573	166,685	15,301	19,098
November	125,991	87,750	19,428	17,866
December	35,121	53,611	7,981	10,750
	2,149,853	2,590,996	228,127	382,305

*The Zoological Park and the Aquarium were closed by a strike between April 2 and May 19, 1961.

The total number of visitors at the Zoological Park between its opening on November 9, 1899, and December 31, 1962, was 136,842,533.

DEPARTMENT OF MAMMALS

JOSEPH A. DAVIS, JR., *Curator*
GRACE DAVALL, *Assistant Curator*
JOSEPH RUF, *Head Keeper*
LEE S. CRANDALL, *General Curator Emeritus*

THE INCREASE of the mammal collection in 1962 to 588 specimens of 204 species is largely the result of our efforts to establish breeding herds of representative hoofed animals.

THE COLLECTION

The Elephant House, with its few but long-lived inhabitants, traditionally shows the least change in population of all the Department's installations, but 1962 saw the deaths of two old inhabitants and the arrival of two new ones. In January, Bessie, our Indian Rhinoceros, purchased from Frank Buck in 1923, was found unable to rise to her feet. Bessie had been declining sporadically over the past few years, and since diagnosis of her trouble was impossible, as was any thought of moving her, it was regretfully decided that she must be destroyed. Bessie, estimated to have been three years old on arrival, had lived in the Zoological Park for 38 years and eight months. In August, Sudana, our African Bush Elephant, 31 years at the Park went down with an incurable arthritis and had to be euthanized.

A specially made crate and much patience enabled us to move the Black Rhinoceros to a long-unused stall and yard next to the Indian Elephants, freeing his old stall and the one vacated by Bessie's death for a pair of young White or Square-lipped Rhinoceroses. These arrived in September and settled readily into their new quarters.

Maned Wolves have never been exhibited in the Park before and are notoriously difficult to keep alive. When we were offered a pair of immature specimens we accepted with some misgivings. Upon arrival the animals were found to be infected with a variety of internal parasites, but treatment has reduced the infestation markedly and the animals have grown and improved in appearance.

Included in a group of common South American mammals brought to the Park by a dealer for examination was a totally unfamiliar and most strikingly colored opossum. None of the usual reference works were helpful in identifying it for, as it turned out, the only two known specimens of the genus and species were collected in 1950, and described a year later. Already this first known living specimen of the Black-shouldered Opossum, *Caluromysiops irrupta,* has provided interesting information about the habits of the species.

A number of specimens came to us as gifts, notably a pair of young Guanacos from Trustee John H. Phipps. Mr. René Honegger of the Zurich Zoo, Switzerland, presented us with a pair of Garden Dormice, and a pair of Japanese Chipmunks came from the Franklin Park Zoological Gardens in Boston. The Highland Park Zoological Gardens of Pittsburgh gave us a male Dybowski Deer, to bring new blood into our herd.

To call the future of the world's large mammals uncertain is to be optimistic. In the hope that at least some species may find their ultimate preservation in captivity, as did the Wisent and Père David's Deer, the New York Zoological Society is endeavoring to build up self-perpetuating herds of certain species. The choice of species is not always an easy one to make, and we have tried to settle, among the antelopes for example, upon a number of species which represent the spectrum of variation within the group. The first animals in this program have arrived: 7 Blesbok, a pair of White-tailed Gnu (the female in advanced pregnancy at the year's end), and a trio of Gemsbok. A male and two young female Père David's Deer were purchased from the Cleveland Zoological Society to bolster our herd.

BREEDING

Of the 82 mammals born during the year, several are worthy of note. The adult Small Malayan Mouse Deer produced her third offspring of the year in November and appeared to be pregnant again at the year's end. The reproductive behavior of this prolific ungulate is the subject of a continuing study.

The small herd of Thomson's Gazelles we purchased in September, 1961, produced four young, two of which survived.

A high rate of infant mortality in the Nyala herd has been of concern to us in recent years. A study of records kept since the beginning of the herd in 1938 showed no significant difference in the mortality picture over the years, indicating no new factors that might be involved. Post-mortem studies by the Veterinarian indicated a dietary problem, and treatment of newborn Nyalas has been instituted along with modifications in the winter management of the herd. It is too soon to see definite results but early indications are hopeful.

Lion cubs in a zoo are no novelty, but the two born to the pair of Lions in the African Plains were eagerly awaited. They were allowed onto the island as toddlers and under parental supervision learned the limits of their enclosure as they grew. In past years, half-grown cubs placed on Lion Island often sustained injuries when they jumped or fell into the moat.

PHYSICAL IMPROVEMENTS

The use of naturalistic settings in the Monkey and Small Mammal Houses was expanded during the year. The interior Lion House cages, formerly a monotonous cream color, have been repainted in various hues that show the large cats to better advantage. To provide an area where newborn Chinese Water Deer could find seclusion from rutting Père David's Deer, an addition to the present range was designed, for early spring construction. A new range for Wisent was designed and approved for construction in the woods opposite the present Roosevelt's Elk exhibit.

Meetings were held with architects and engineers concerned with design of the World of Darkness, Kadiak Bear Exhibit and African Forest West exhibit. Plans for the last have been completed, and those for the first two projects were well along by the end of 1962.

PUBLICATIONS (MR. DAVIS)

Red Light Pays Dividends, *Animal Kingdom.* LXV (1): 3-5.
Family Life on Lion Island, *Animal Kingdom.* LXV (3): 78-79

OTHER ACTIVITIES

Mr. Davis attended the annual meeting of the American Society of Mammalogists at Middlebury, Vermont.

Projects sometimes begin in an unexpected way. Early in the year Mr. Davis fulfilled a long-standing ambition when he obtained a tame otter *(Lutra annectens).* A detailed study of its complex vocal repertoire, utilizing a tape recorder, is in progress. When the basic vocabulary of the first species has been established, the study will be enlarged to encompass other species presently in, or to be added to, the collection, to provide a comparative picture of the ethology of this specialized group of mammals. A study of reproduction and postnatal development in the Small Malayan Mouse Deer, begun early in the year, continues.

In past years identification of individual members of the herds of ungulates has been difficult, and in some cases impossible. This year a program of identifying all newborn and newly arrived animals with inconspicuous metal ear tags was inaugurated. Eventually all herd animals will be identifiable, and will provide accurate data on breeding, longevity and medical history.

SUMMARY

A modest increase in the size of the collection again reflects improved management and an effort to build up herd animals into self-replenishing units. The increase is partly a result of slight additional space available to the animals and a better use of existing facilities. A system for identifying individual animals in herds was begun. New color schemes and natural settings in existing enclosures has added to the attractiveness of several exhibits. Designs for three new major exhibits are completed or under way.

FORMS NEW TO THE COLLECTION, ACQUIRED IN 1962

Black-shouldered Opossum—*Caluromysiops irrupta* Sanborn
Short-tailed Shrew—*Blarina brevicauda talpoides* (Gapper)
Epaulet Bat—*Epomophorus wahlbergi* (Sundevall)
Dog-faced Bat—*Rousettus aegyptiacus* Geoffroy
Silky Anteater—*Cyclopes didactylus ida* Thomas
Forest Ground Squirrel—*Euxerus erythropus moestus* Thomas
Side-striped Squirrel—*Funisciurus leucostigma leucostigma* (Temminck)
Asiatic Chipmunk—*Tamias sibiricus lineatus* Siebold
Hoary Marmot—*Marmota caligata* (Eschscholtz)
Maned Wolf—*Chrysocyon brachyurus* (Illiger)
Long-tailed Weasel—*Mustela frenata noveboracensis* (Emmons)
Panama River Otter—*Lutra annectens repanda* Goldman
Square-lipped Rhinoceros—*Ceratotherium simum simum* (Burchell)

CENSUS OF MAMMALS

December 31, 1962

Orders		*Species & Subspecies*	*Specimens*
MARSUPIALIA	Kangaroos, Phalangers, Opossums, etc.	6	9
INSECTIVORA	Moles, Shrews, Hedgehogs, etc.	2	2
CHIROPTERA	Bats	2	4
PRIMATES	Apes, Monkeys, Lemurs, Marmosets, etc.	53	103
EDENTATA	Armadillos, Sloths, Anteaters	4	5
PHOLIDOTA	Pangolins	1	1
RODENTIA	Squirrels, Beavers, Mice, Porcupines, etc.	30	84
CARNIVORA	Bears, Raccoons, Cats, Dogs, Otters, etc.	44	95
PINNIPEDIA	Seals, Sea Lions, Walruses	4	9
TUBULIDENTATA	Aardvarks	1	1
PROBOSCIDEA	Elephants	2	3
PERISSODACTYLA	Horses, Tapirs, Rhinoceroses	6	9
ARTIODACTYLA	Cattle, Sheep, Antelopes, Camels, Giraffes, Deer, Swine, Hippopotamuses	49	263
	TOTALS	204	588

Summary: Orders, 13; Species & Subspecies, 204; Specimens, 588.

DEPARTMENT OF BIRDS

William G. Conway, *Curator*

Peter L. Ames, *Assistant Curator*

(since September 1, 1962)

Grace Davall, *Assistant Curator*

Joseph Bell, *Head Keeper*

Lee S. Crandall, *General Curator Emeritus*

The Society's bird collection included 646 species and 1,533 specimens on December 31, 1962. Twenty-three orders were represented.

The Collection

Three hundred and fifty-seven birds were added to the collection during 1962, only 126 by purchase and more than seventy through zoo breeding.

An effort is being made to establish larger breeding groups to be maintained as self-replacing exhibits for certain families. A representative systematic collection is still a primary aim although those bird families normally exhibited in the Main Bird House must be gradually decreased in view of plans for replacing this building.

Twenty-six species new to the collection, several from Edward Marshall Boehm, a Patron of the Society, were added. The most outstanding of Mr. Boehm's gifts were two Yellow-billed Chlorophonias, a lovely tanager so rare that its curious adult plumage had never been described. A Liberian zoologist, Mrs. Dora Weyer, sent a specimen of the little known Akun Eagle-Owl to us and the Fish and Wildlife Service sent us a fine pair of Lesser Sandhill Cranes. Important purchases included several birds of paradise, from a Dutch firm, and a magnificent pair of Bearded Vultures or Lammergeyers.

No botulism occurred in the waterfowl exhibits during the year, perhaps because of the exhibit improvements reported last year. However, no major outbreaks occurred in local free-flying ducks and geese and we await 1963 with no great feeling of confidence.

Abandonment of the old Aquatic Bird House occasioned the removal of our two Atlantic Puffins from their special cooler. Though showing little outward evidence of distress, both birds soon died. They had completed almost five years in the collection—an outstanding captive record for their species.

A Goffin's Cockatoo acquired in 1932 was stolen, though vandalism was decidedly reduced through the efforts of an improved night watchmen's force.

FORMS NEW TO THE COLLECTION, ACQUIRED IN 1962

African Pigmy Goose—*Nettapus auritus* (Boddaert)
Blacksmith Plover—*Hoplopterus armatus* (Burchell)
Red-crested Touraco—*Tauraco erythrolophus* (Vieillot)
Little Cuckoo—*Piaya minuta gracilis* (Heine)
Akun Eagle Owl—*Bubo leucostictus* Hartlaub
Tschudi's White-throat—*Leucippus chionogaster chionogaster* Tschudi
D'Orbigny's Quetzal—*Pharomachrus mocino antisianus* (d'Orbigny)
Natal Pigmy Kingfisher—*Ispidina picta natalensis* (A. Smith)
Brown-hooded Kingfisher—*Halcyon albiventris orientalis* Peters
Southern Broad-billed Roller—*Eurystomus glaucurus pulcherrimus* Neumann
Southern Black-cheeked Woodpecker—*Centurus pucherani pucherani* (Malherbe)
Sulphury Flycatcher—*Tyrannopsis sulphurea* (Spix)
Baird's Flycatcher—*Myiodynastes bairdi* (Gambel)
Capuchin Babbler—*Phyllanthus atripennis haynesi* (Sharpe)
Little Minivet—*Pericrocotus cinnamomeus peregrinus* (Linnaeus)
Blue-fronted Redstart—*Phoenicurus frontalis* Vigors
Plumbeous Water Redstart—*Rhyacornis fuliginosus fuliginosus* (Vigors)
Straight-crested Helmet Shrike—*Prionops plumata poliocephala* (Stanley)
Waller's Chestnut-winged Starling—*Onychognathus walleri* (Shelley)
Black-faced Honey-eater—*Meliphaga virescens sonora* (Gould)
White-bearded Honey-eater—*Meliornis novaehollandiae novaehollandiae* (Latham)
Southern Scarlet-chested Sunbird—*Chalcomitra senegalensis gutturalis* (Linnaeus)
Yellow-billed Chlorophonia—*Chlorophonia flavirostris* Sclater
Small Spotted Calliste—*Tangara varia* (P.L.S. Müller)
Gray and Gold Calliste—*Tangara palmeri* Hellmayr
Crimson Finch—*Rhodospingus cruentus* (Lesson)

THE BREEDING PROGRAM

Nearly 100 species of birds deposited 1,670 eggs—432 more than in 1961. Species reared in our collection for the first time included the Crested Wood Partridge, the Scintillating Copper Pheasant, Ringed Teal, Red-billed Pintail, Tataupa Tinamou and Zabele's Red-legged Tinamou. More Laysan Teal were reared without incident and our unusual Killdeer "colony" entered its third generation.

Much new avicultural information was gathered and plans were laid to set up a sorely needed bird-rearing area away from public view behind the Ostrich House.

PHYSICAL IMPROVEMENTS

Work began on the greatly delayed new Aquatic Birds exhibit building during August. This display is demanding much of the Curator's time and an opening is planned for the spring of 1964. The new building will emphasize the relation of birds and habitat. Exhibits specifications were prepared for a proposed "World of Birds" building and architectural planning began in October. The Bird Department staff also participated in meetings with architects and engineers concerning the design of the proposed "World of Darkness."

The Ostrich House was equipped with temporary quarters to house flamingos and other aquatic birds and winter cages were constructed for birds of prey in the Monkey House cellar. Unused greenhouses at the Farm-in-the-Zoo were adapted as bird and reptile breeding and winter quarters. The Flying Cage was repainted and regraded preparatory to the installation of decorative plantings and a walk-through viewing bridge was scheduled for 1963. The "display sign" program was enlarged with new illustrative signs in the Penguin and Main Bird Houses.

RESEARCH

The Curator's priority responsibilities as Director have made the initiation of new research impractical, although observational work continues to be recorded. Practical and applied research continues with an emphasis on the development of new exhibition and care techniques.

As usual, the Department cooperated in the research programs of many other institutions.

PUBLICATIONS (MR. CONWAY)

The Weights of 11 Living Eagles and Vultures at the New York Zoological Park. *The Auk,* 79 (2): 274-275.

A Yellow-billed Chlorophonia. *Animal Kingdom,* LXV (2): 60-61.

Two *Animal Kingdom* articles, concerning hummingbirds and our 1960 flamingo expedition, were translated into German and published in *Das Tier.*

OTHER ACTIVITIES

On September 1, Mr. Peter Ames was appointed Assistant Curator of Birds. Mr. Ames comes to us from Yale University where he is a candidate for a doctoral degree.

The Curator made several radio and television appearances and presented a paper on zoo conservation matters at meetings of the American Association of Zoological Parks and Aquariums. The Association's President appointed Grace Davall to act as Chairman of the Constitution, Advisory Legislation and By-laws Committee and

Mr. Conway was again appointed Chairman of the Association's Conservation Committee and participated in the organization of the Wild Animal Propagation Trust. The Trust is expected to devote its efforts to the best utilization and propagation of captive stocks of endangered species.

SUMMARY

Construction began on a major new display building replacing the 1899 Aquatic Bird House. The collection remains large and representative, with improving breeding results. A new installation is needed for rearing young birds.

Further new displays using many new techniques are in the planning stage. It is hoped that the Department's Main Bird House will soon be replaced with a striking new building to be called "The World of Birds."

Insufficient staff prevents the development of a significant departmental research program.

CENSUS OF BIRDS
December 31, 1962

Orders		*Species & Subspecies*	*Specimens*
SPHENISCIFORMES	Penguins	8	22
STRUTHIONIFORMES	Ostriches	1	1
CASUARIIFORMES	Cassowaries and Emus	2	2
TINAMIFORMES	Tinamous	5	12
PELECANIFORMES	Pelicans, Cormorants, etc.	7	8
CICONIIFORMES	Herons, Ibises, Storks, etc.	16	22
PHOENICOPTERIFORMES	Flamingos	6	36
ANSERIFORMES	Swans, Ducks, Geese and Screamers	107	458
FALCONIFORMES	Vultures, Hawks and Eagles	33	44
GALLIFORMES	Quail, Pheasants, etc.	37	126
GRUIFORMES	Hemipodes, Cranes, Trumpeters, etc.	26	69
CHARADRIIFORMES	Plovers, Sandpipers, Gulls, etc.	27	74
COLUMBIFORMES	Pigeons, Doves and Sandgrouse	25	60
PSITTACIFORMES	Parrots, etc.	19	27
CUCULIFORMES	Touracos and Cuckoos	10	11
STRIGIFORMES	Owls	12	18
CAPRIMULGIFORMES	Frogmouths, Nighthawks, etc.	2	2
APODIFORMES	Hummingbirds	8	9
COLIIFORMES	Mousebirds	1	1
TROGONIFORMES	Trogons and Quetzals	3	8
CORACIIFORMES	Kingfishers, Hornbills, etc.	17	27
PICIFORMES	Barbets, Toucans and Woodpeckers	30	54
PASSERIFORMES	Perching Birds	244	442
	TOTALS	646	1,533

Summary: Orders, 23; Species & Subspecies, 646; Specimens, 1,533.

DEPARTMENT OF REPTILES

Herndon G. Dowling, *Curator*

Stephen Spencook, *Head Keeper*

Our attempts to provide better and more meaningful displays and more adequate housing for the rare and valuable animals under our care have resulted in a reduction in the number of animals maintained by the Department. However, this change of emphasis has placed a much greater proportion of our animals in public view—the place where they really count.

The Collection

At the end of 1962 the collection numbered 692 specimens of 258 species and subspecies. It is exceeded in variety only by the collection of the San Diego Zoo and exceeded in our own history only by last year's count of 269 kinds of amphibians and reptiles.

A part of the reduction in numbers was due to our donation of several specimens that had only remote possibility of exhibition to other institutions where it was felt they might be of more value. Some of these were specimens that were collected in the Galapagos Islands, others were small or undistinguished individuals with little public appeal. Some such specimens had been maintained "behind the scenes" of the Reptile House for as long as five years without having been placed on exhibition. Thus, while they added to the species list, and while some were of considerable interest for reasons of rarity, they did not improve the exhibition. A rather large collection is still maintained behind the scenes, but all are there for some purpose other than the mere maintenance of numbers.

Of the 859 specimens that came into the Department during the year, most (477) were donated, 230 were purchased, 101 were collected by the Curator, 26 were obtained by exchange, and 25 were born or hatched into the collection.

Besides the gifts from our own Aquarium and Tropical Research Station, the Department received specimens from the American Museum of Natural History, the Berlin Aquarium, the Bureau of Internal Affairs of New Zealand, the Crandon Park Zoo of Miami, the Franklin Park Zoo of Boston, the New England Aquarium of

Boston and the Rye (New York) Nature Center. Members and friends of the Zoological Society who donated specimens include Mr. Kenneth Babrowsky, Mr. John Dunston, Mr. Robert Hellman and Mr. and Mrs. Gerald Tawney.

In turn, specimens were sent out to the American Museum of Natural History, the Berlin Aquarium, the Buffalo Zoo, the Fresno Zoo, Lafayette College (Easton, Pennsylvania) the Mestni Aquarium (Maribor, Yugoslavia), the San Diego Zoo, the Staten Island Zoo and the Zürich (Switzerland) Zoo.

Our attempts to set up breeding colonies of rare and threatened animals continues. In line with this two female Radiated Tortoises *(Geochelone radiata)* were purchased and added to our existing trio; a mate was found and collected for our Duncan Saddleback Tortoise *(Geochelone elephantopus ephippium)* that has been in the collection since 1928; a female Chinese Alligator *(Alligator sinensis)* was purchased and added to our previous pair.

Several serious and unexpected losses were suffered by the Department during the year. "Teddy," the South American Tortoise *(Geochelone denticulata)* that had come to the collection in 1914, drowned in the moat of a new enclosure. The Tuatara *(Sphenodon punctatum)*, obtained by courtesy of the New Zealand government in 1957, died, possibly from lead-poisoning. Our old (1952) Broad-nosed Crocodile *(Osteolaemus tetraspis)* was killed by one of its companions, as was one of our Indian Gavials *(Gavialis gangeticus)*.

Most of our specimens date from the renovation of the Reptile House exhibits in 1954 or later and our number of ten-year longivity records is still small. The following list of animals still living in the collection is made up of some of the few animals that were obtained before that date.

Current Longevity Records—1962

Species	*Arrived in Park*
Duncan Saddleback Tortoise *Geochelone elephantopus ephippium* (Guenther)	1928
Nile Crocodile *Crocodylus niloticus* Laurenti	1941
Indian Gavial *Gavialis gangeticus* (Gmelin)	1946
American Alligator *Alligator mississipiensis* (Daudin)	1950
South American Mud Turtle *Kinosternon scorpioides* (Linnaeus)	1950
Reticulated Python *Python reticulatus* (Schneider)	1951
Indian Rock Python *Python molurus* (Linnaeus)	1951
African Rock Python *Python sebae* (Gmelin)	1952
King Cobra *Ophiophagus hannah* (Cantor)	1953

PHYSICAL IMPROVEMENTS

A large behind-the-scenes area, including the office of the Head Keeper, the Mouse Room and the food preparation room, was renovated by repainting, floor tile and new fluorescent lighting. A commercial compressor-type air conditioner has replaced the overloaded window unit that cooled montane and nocturnal reptiles and is also used to control the temperature in the local exhibit section.

Two new areas were added to the Reptile Department. The old Panda Moat area was renovated to provide a summer Galapagos Exhibit and one of the greenhouses on the Farm was renovated to provide, in part, adequate winter quarters for the Galapagos Tortoises and land iguanas.

RESEARCH

A planned month's trip to the Galapagos Islands, 600 miles off the coast of Ecuador, was unexpectedly extended to two months when the mail boat, upon which we depended for transportation, went into dry-dock. This "bonus" time in the islands was spent in more extended research on the life history and environmental requirements of the Marine Iguana *(Amblyrhynchus cristatus)*, which was the main object of the expedition, and further observations on the status of the native animals of the islands. Curator Dowling was accompanied by Robert S. Chase, Jr., Lafayette College, Easton, Pennsylvania, and David S. Boyer, National Geographic Society. René Honegger, Zürich Zoo, was able to join the expedition through the generosity of two of our Members, Mr. and Mrs. Gerald Tawney.

Other research activities proceeded at a snail's pace due to limitation of the Curator's time by other duties and by the absence of any other professional staff to take advantage of the many research opportunities offered by the large and varied collection. Curator Dowling maintained his interest in ratsnake relationships and snake taxonomy (supported by the National Science Foundation) and in brooding pythons and the food and temperature requirements of other reptiles. However, little time was available for such studies.

PUBLICATIONS (DR. DOWLING)

Snakes. *American People's Encyclopedia Yearbook for 1961.*

Some Like It Hot—Some Like It Cold. *Animal Kingdom,* LXV (2): 41-47.

Wie alt und wie lang können Riesenschlangen werden? *Das Tier,* No. 6: 16-17 (Translation from *Animal Kingdom,* LXIV (6)).

World's End Revisited. *Animal Kingdom,* LXV (5): 130-142.

The Marine Iguanas. *Animal Kingdom,* LXV (6): 169-174.

OTHER ACTIVITIES

Curator Dowling attended the Winter meeting of the American

Association of Zoological Parks and Aquariums in Birmingham and the (First) International Conference on Taxonomic Biochemistry at Lawrence, Kansas. He presided at the annual meeting of the Herpetologists League and presented a paper on "Galapagos Reptiles" before that group, which met in conjunction with the Philadelphia meeting of the American Association for the Advancement of Science.

He presented a film on "The Galapagos Today" before the Mendelian Society of Manhattan College and the annual meeting of the Zoological Society, lectured on "Zoogeography and Evolution" to a class of biology teachers at the Bank Street College of Education, and talked on "Snakes and Snakebite" before the Adventurers Club of New York.

SPECIES NEW TO THE COLLECTION ACQUIRED IN 1962

Albemarle Saddleback Tortoise, *Geochelone elephantopus becki* (Rothschild)
Big-headed Turtle, *Platysternon megacephalum* Gray
Preto Sideneck Turtle, *Podocnemis cayennensis* (Schweigger)
Madagascan False Hognose Snake, *Leioheterodon madagascariensis* (Dumeríl & Bibrón)
Rufous Beaked Snake, *Rhamphiophis oxyrhynchus* (Reinhardt)
Madagascan Boa, *Sanzinia madagascariensis* (Dumeríl & Bibrón)
Kufa, *Trimeresurus okinavensis* Boulenger

SUMMARY

Improvements in maintenance facilities and procedures together with a change of emphasis in exhibition resulted in a somewhat lower species count but better care and exhibits. The new Galapagos area added a major, though summer-limited, exhibition to the Department. The Greenhouse area adds a new dimension to the winter care of our large tortoises and the air-conditioned areas allow the maintenance of otherwise difficult species. However, temperature control in the remainder of the uninsulated Reptile House is virtually nonexistent.

CENSUS OF AMPHIBIANS AND REPTILES

Orders		*Species & Subspecies*	*Specimens*
	AMPHIBIA		
CAUDATA	Salamanders	12	34
SALIENTIA	Frogs and Toads	23	50
	REPTILIA		
TESTUDINES	Turtles	72	169
CROCODYLIA	Alligators and Crocodiles	15	45
SQUAMATA			
SAURIA	Lizards	24	59
SERPENTES	Snakes	112	209
VARIOUS ORDERS	Research Specimens and surplus	––	126
	TOTALS	258	692

Summary: Orders, 5; Species, 258; Specimens, 692.

ANIMAL HOSPITAL

CHARLES P. GANDAL, *Veterinarian*

RENOVATION OF the Animal Hospital in 1962, with a rearrangement of rooms, greatly reduced the flow of traffic and permitted separation of treatment and surgery areas. Walls of the Hospital were partially tiled and numerous pipes, radiators, sliding doors and other dust-catchers were removed. A 200-milliamp X-ray machine replaced outmoded 19-year-old equipment.

CASES OF ESPECIAL INTEREST

The Zoological Park's outstanding herd of Nyala antelopes regularly produces young, but there has been a relatively high mortality among newborn and immature animals. We have now discovered that they were suffering from white muscle disease which is related to both Vitamin E and selenium deficiencies; the same disease entity was diagnosed in one of the kangaroos and in a Sable Antelope. The treatment has consisted of feeding timothy hay instead of alfalfa, on the supposition that the high-quality legume hay may have insufficient amounts of selenium, which is inactivated by the high fertilizer requirements of alfalfa. In addition, all newborn Nyala were given selenium injections within a week following birth and no further mortality was observed.

Numerous orthopedic procedures are worthy of comment. Fifteen fractures of the long bones in birds were treated, including a fractured radius in a flamingo, a mandibular fracture in a Manchurian Crane that was splinted using semi-rigid plastic tubing, a fracture of the upper and lower jaws in a white Ibis and bilateral fractures of the tibia in a Monkey-eating Eagle. The latter's fractures were treated by simple pressure bandages after the bird was anesthetized and the bones aligned. It was held in a sling for eight weeks during which time it was hand fed by its Keeper and eventually made an excellent recovery.

Orthopedic procedures on mammals included the amputation of a gangrenous leg of a Chevrotain to save her for future breeding use, and the successful intramedullary pinning of a compound fracture of the tuber calcis in a male Cheetah.

A bilateral coxofemoral luxation sustained by our baby Okapi was quite severe and resulted in ruptured joint capsules. With the aid of an experienced veterinary orthopedic surgeon, Dr. Robert Clark, operative procedures were initiated to correct this condition. Unfortunately, though the operation had progressed quite well, the patient suddenly aspirated stomach fluid into the lungs, and in spite of our best efforts at resuscitation we were not able to revive it.

Other interesting operative procedures included removal of a squamous cell carcinoma from the peri-anal region of a King Cobra and suturing of the lower jaw of an Axis Deer that had run into a fence and severed over one half of the attachment of the lower lip.

We continue to use promazine hydrochloride as a tranquilizer to good effect both in the shipment of animals and for quieting nervous animals. When we were required to spray two newly-arrived White Rhinoceroses, because of a possible tick infestation, they were put on tranquilizers for three days prior to the spraying and we had little difficulty when we actually did the spraying—which certainly would not have been the case without the tranquilizers. Tranquilizers were also used on newly arrived Gemsbok and White-bearded Gnu to help them settle down.

Tranquilizers proved their value when a Giraffe and a Camel both refused to nurse their young following parturition. Neither of these mothers had ever nursed and reared a baby, their udders were quite tender and painful and they were obviously ill at ease. Both were given large daily doses of promazine and a diuretic, chlorothiazide, and after 28 to 36 hours they settled down and were relieved sufficiently by the medication to accept their offspring and nurse them in a normal manner. Each reared her baby with no further problems. Wild animals rarely accept offspring that they have abandoned and our success should be of especial interest to other zoos.

We continue to make excellent use of the injection gun apparatus, utilizing it on numerous patients ranging from our female Tiger "Dacca" who was immobilized to facilitate cutting her ingrown toe nails, to its multiple use in our male Elk who had sustained a severe subcutaneous bacterial infection which necessitated continued drainage and treatment.

The baby Orang-utans that had been quarantined in the Hospital since October of 1961 were released March 18 to the Great Apes House in excellent condition. In the latter part of the year one of them showed a recurrence of the balantidia infection that had bothered them on their arrival and two months of intensive treatment with oxytetracycline and carbarsone was necessary to effect a cure.

Several deaths must be noted, including that of the African Elephant "Sudana" who was suffering from chronic arthritis and finally became moribund and was euthanized. Our aged Indian Rhinoceros succumbed to the infirmities of old age and an extensive bile duct carcinoma. One of the great favorites of the Zoo and especially of the children that frequented the Riding Track was the Dromedary "Tracy" who died in her sleep after having been retired from active use at the start of this season.

PREVENTIVE MEDICINE

Preventive medicine procedures followed quite closely those of previous years, with quarantine of newly-acquired specimens, tuberculosis testing of 21 mammals and birds, psittacosis testing of three birds and the vaccination of 24 mammals against panleukopenia and/or canine distemper and canine hepatitis.

As routine checks and also to forestall any possibility of parasite build-up, 418 stool samples were examined in the Hospital Laboratory. A total of 127 mammals, 42 birds and 14 reptiles received vermifuge treatments during the year. We investigated the uses of a new vermifuge, thiabendazol, and found that it was quite efficacious in some of our ruminants, especially those that did not seem to respond to the use of phenathiazine which has been so effective throughout the years.

RESEARCH

Our research activities are essentially limited to clinical investigations but the Hospital supplied numerous specimens and materials to investigators with basic research facilities. Throughout the year 267 specimens were sent to 20 cooperating investigators in 12 institutions.

OTHER ACTIVITIES

Dr. Gandal served on the Public Relations and Program Com mittees of the Westchester County Veterinary Medical Association. In addition, he spent five days filming the initial program for the new "Discovery" series on ABC which featured our Zoo veterinary service. He also appeared on the television program "Play Your Hunch" and addressed the Pleasantville Rotary Club on "The New York Zoological Society and its Veterinary Service." The New Jersey Veterinary Association visited the Zoo as a group on September 19 and was given a tour and lecture regarding the Zoo and its veterinary service.

PAPERS PRESENTED (DR. GANDAL)

"Surgery of Subcutaneous Tumors in Parakeets." New York State Annual Veterinary Conference, September 19, 1962.

Seminar on "Treatment of Unusual Pet Animals and the Practice of Veterinary Medicine in a Zoological Park." University of Pennsylvania, College of Veterinary Medicine.

"Veterinary Practice at a Zoological Park." Westchester Veterinary Medical Association.

"Veterinary Service for Unusual Pets." Mid-Hudson Veterinary Medical Association.

FIRST AID

The First Aid facilities have now been moved to the First Aid building just outside of the Hospital on a year 'round basis. The building has its own heat supply and a two-way intercom system so that it is not necessary for first aid patients to enter the Hospital itself.

There were 1,154 cases requiring first aid, of which 487 involved employees and 667 visitors. Seventeen members of the Zoological Park Blood Bank donated blood and 13 pints were distributed among 6 recipients.

STATISTICS

The Hospital Laboratory handled 418 laboratory specimens involving a variety of procedures, including antibiotic sensitivity testing, stool examinations for parasites, bacteriological and mycological cultures and blood counts.

Birds hospitalized numbered 9 for 183 days and mammals 50 for 2,097 days. Outpatient treatments included 412 mammals, 159 birds and 51 reptiles.

In the mortality tables that follow, "Total in Collection" is arrived at by adding to the census at the beginning of the year all animals acquired by purchase, exchange, gift or born alive. Animals disposed of alive by sale or exchange during the year are not deducted. No acclimatization period following birth or arrival is allowed.

MORTALITY TABLE

MAMMALS

Year	*Total in Collection Throughout the Year*	*Died*	*Mortality Percentage*
1962	808	202	25.00
1961	724	128	17.68
1960	737	122	16.55
1959	718	106	14.76
1958	545	117	21.46
Totals	3532	675	

Average mortality for past 5 years....................19.11
Average mortality for past 20 years..................17.35

BIRDS

Year	*Total in Collection Throughout the Year*	*Died*	*Mortality Percentage*
1962	1890	385	20.36
1961	2339	437	18.68
1960	2119	273	12.88
1959	2051	343	16.72
1958	1713	348	20.31
Totals	10117	1786	

Average mortality for past 5 years....................17.65
Average mortality for past 20 years....................16.23

CONSTRUCTION AND MAINTENANCE

Charles B. Driscoll, *Superintendent of Operations*

George Russell, *Assistant Superintendent of Construction*

Louis Sanders, *Assistant Superintendent of Maintenance*

In a tightly packed Zoo, demolition of an animal building has wide repercussions. Such was the case when the Aquatic Bird House demolition started on August 3. As a preliminary, quarters had to be found—for the most part created—for the birds in the Ostrich House, Monkey House basement and one of the unused greenhouses at the Farm-in-the-Zoo. Construction of the new Aquatic Bird House was well under way, as a Capital Budget project with an outside contract, at the end of the year.

Among other sizeable jobs was completion of the Animal Nursery in May, under contract but with sewer and electrical services installed by our own staff; almost complete remaking of the interior of the Animal Hospital, and adaptation of the old Panda Moat for the exhibition of Galapagos animals. One Capital Budget project designed and supervised by the Park Department was the installation of a three-zone hot water heating system in the Lion House.

In addition to some 2,000 work orders, typical jobs were creation of a file room in the basement of the Heads & Horns Museum (to make storage space available in the Administration Building basement), preparation of a photographic studio in the Service Yard, building a souvenir stand for Baird Court, putting together nine "New Ideas" signs and assorted parking field and educational signs, putting down about 2,000 square yards of paving and more than 1,200 feet of fencing around the Elephant House and the Children's Zoo, providing an attractive "snack room" for clerical employees in the Administration Building and new locker quarters for Maintenance employees and putting a new air-conditioning unit in the Reptile House.

To speed the work, seven new motor vehicles were acquired: three pick-ups for shop use, two dump trucks, one rack truck for Maintenance and a four-wheel-drive "Scout" for the Security force.

Increased vandalism caused us to reorganize the night firemanwatchman force, and to assign three uniformed Special Officers to patrol the Park at night. We are not as fully staffed as is desirable, but the Security force is effective; 28 vandals between the ages of 10 and 42 years were captured.

Over the past 22 years, 11 American elms out of 46 on Baird Court have been lost because of the Dutch elm disease. Old stumps have now been removed and planting pockets prepared for seven pin oaks and four thornless honey locusts. The north end of Baird Court was relandscaped with mixed evergreen ornamental shrubs and the approach from Fountain Circle was made gay with petunias, cannas, begonias, caladiums and spring-flowering bulbs. Some 250 mountain laurels and leucothoes were set out along Elephant House walk.

On November 28 William Allen retired after 22 years as a competent and hard-working supervisor of the Maintenance Department. Park Foreman Louis Sanders was promoted to succeed him.

FACILITIES DEPARTMENT

Edward Kearney, *Manager*

Edward Quinn, *Assistant Manager*

Previous records for sales of refreshments and souvenirs were exceeded in 1962. One element was certainly the modernized novelty gift shop on Baird Court; in addition to unusual gifts, postcards, film and publications, it sold 22,000 balloons during the short summer season.

A new type of refreshment trailer was tested at the north end of the Lion House and sales improved considerably. At the south end of the same building an automatic soft drink dispenser was tested and proved to be so efficient that similar machines will be installed in all refreshment stands. Bottled drinks will eventually be eliminated.

MISCELLANEOUS OPERATIONS AND SERVICES

Children's Zoo. The Animal Nursery, first major addition to the Children's Zoo since it was opened in 1941, has greatly increased the popularity of this installation. Admissions in 1962 to the Children's

Zoo were 307,563, representing over 14% of the general Zoo attendance for the period of its operation from mid-April to mid-November.

TIGER TRAINS. Four regular tractor trains were equipped with loudspeakers and put into service for lecture tours of the Zoo. More than 70,000 visitors made the tour in the first summer of operation.

FARM-IN-THE-ZOO. Attendance of 108,626, including 92,189 paying visitors, was the second highest since the Farm was opened.

RIDING TRACK. A record gross income was produced from 336,770 rides, but because of increased overhead costs the net income was not as great as in 1961.

THE AQUARIUM

THE DIRECTOR'S REPORT

CHRISTOPHER W. COATES, *Director*

CASH OPERATIONS FOR THE YEAR came quite close to covering operating expenses. We have not done this since opening year, 1957, at which time we did not have to finance the relatively poor months at the beginning of the year. This favorable situation is undoubtedly due to widely publicized new attractions, of which two of major importance were added in 1962, and to the increased awareness of the Aquarium and its location on the part of the public.

The most significant addition this year was Polar Bay, which is probably the best facility of its kind, and which was initiated by a gift from Bernard and Alva Gimbel. Polar Bay, with extensive haul-out areas, is designed for the exhibition of walruses and similar large pinnipeds from cold to Arctic and Antarctic regions and it is large and deep enough to accommodate animals which do not leave the water, such as the smaller cetaceans. It is not intended, however, that Polar Bay should replace the proposed Whale Stadium which would be an even larger tank and employ quite different techniques. Polar Bay is actually a complex of five units: a main tank of 70 by 40 feet and 8 feet 6 inches deep; a subsidiary tank 30 feet in diameter and 6 feet 6 inches deep; an off-exhibition isolation tank for the treatment of sick animals and habilitation of new acquisitions; an underwater viewing chamber with 86-square-foot windows, and a filtration unit. The approach of a "complex" rather than a single tank gives great versatility to our operation and certainly is a benefit to the health of animals as difficult to maintain as marine mammals.

The Bathysphere, made famous by the late Dr. William Beebe and W. Otis Barton, became part of the second major exhibit opened this year. This exhibit was designed both as a memorial to Dr. Beebe and to show some early methods of deep-sea exploration, of which Beebe and Barton were pioneers. As a part of the exhibit, models of deep sea creatures first seen alive from the Bathysphere are shown under "black" light. There are also a number of photographs and paintings and some accessory apparatus which explains the operations which were climaxed in 1934 by a record dive to 3,028 feet off Bermuda.

As an effort in a new direction, the landscaping of our grounds has taken on exhibit value with the establishment of a Long Island Sand Dune area showing the natural flora of the North Atlantic coast dunes as it was when our forefathers arrived in the New World. This dune planting has survived its first winter satisfactorily—so well in fact that special efforts had to be made to protect the beach plums and bayberries produced in profusion.

The new filter for the Oceanic Tank, built jointly by the Society and the City of New York, and put into operation in February, has turned out extremely well. It has added enormously to the attractiveness of the Oceanic Tank containing the White (Beluga) Whales. The operation of the filter is part of the display, and the public has access completely around it on the upper deck area of the main building. Late in summer, we were able to put SCUBA divers into the Oceanic Tank for underwater feedings of the whales and the water was so clear that this operation could be clearly observed through the full 60 feet of tank length. Nevertheless, filtration for living animals is a complex operation and the filter unit is still being subject to minor adjustments until all the "bugs" are worked out—which takes a long time for testing and trial.

The public has reacted extremely well to the new exhibits and improvements. Attendance was the highest of our five and a half years of existence at Coney Island. Paid admissions totaled 321,749 and free admissions were 60,556, of which 48,000 were school children.

The death of the world-renowned "Ookie," the first Pacific Walrus ever to live in captivity over a year, serves as a reminder that problems in the handling of these difficult animals are not all solved as yet. Nevertheless, we intend to maintain our position as harboring the world's most varied and complete marine mammal collection and we suspect that in spite of this loss we will succeed in breeding walruses in captivity. Another female, Tipuk, continues to exceed Ookie's growth rate and is as full of personality as walruses always appear to be.

The Society's amended contract with the City of New York, under which certain financial obligations are to be assumed by the City, will be of considerable help in future Aquarium operations. It is obviously difficult to operate on a pay-as-you-go basis when the hours of work, work rules and pay scales are set largely by others. The recognition of this fact by the City is of some moment.

All in all, it has been a good year. Press, radio and television relations have been excellent and we look forward to the construction of Shark Hall and the Whale Stadium with great eagerness. Work on at least one of these should begin in 1963. In these projects, the development of new techniques is taking a good deal of our time in planning and testing. In addition to such major efforts as Shark Hall with its large fish tanks, and Whale Stadium with its capacity for large cold-water marine mammals, we are still preoccupied with suitable small tanks and special exhibits. The processing of water suitable for animals as delicate as fishes and invertebrates requires space for pumps, reservoirs, filters and environmental controls that frequently take four times the space of the actual exhibit. That is, in fact, the major problem of the aquarium man, and improvement in equipment technique our greatest concern.

AQUARIUM OPERATIONS

James W. Atz, *Curator*

Carleton Ray, *Associate Curator*

Aage Olsen, *Superintendent*

Jewell Burns, *Business Manager*

The Collection

Once again we received specimens for our diverse collection from almost every ocean. The marine mammals, pinnipeds and cetaceans, continued to be the most time-consuming and drew the most attention, but just as spectacular has been success in the maintenance of some magnificent invertebrates, particularly tropical and West Coast anemones and the Pacific Giant Octopus.

New ground in the capturing and transport of Arctic seals was broken in the spring. With the cooperation of Autair Helicopter Services and the people of the Magdalen Islands in the Gulf of St. Lawrence, a joint expedition of the Quebec and New York Aquariums succeeded in netting and transporting to the expedition's base by helicopter adults and young of the Harp and Hooded Seals. These species live on the ice and have their pups in March. They are extremely rare in captivity. As a result of the gentle methods of handling, four Harp Seals and two Hooded Seals were successfully brought to New York in March. Five animals survive in excellent condition at the year's end. This is a record of which we may be proud, since Arctic seals are notoriously difficult to maintain.

Again through the cooperation of the Quebec Aquarium, a timely addition was made to the collection. On Member's Day, June 19, an almost pure white Beluga Whale, ten-and-a-half-feet long, arrived by truck from Ile aux Coudres, Quebec, where it had been captured in a reenactment of the old days of the whale weirs of the St. Lawrence. The animal displayed remarkable equanimity and after only two days in captivity it fed from a tankman's hand. In August it nearly succumbed to a lung parasite infestation, but was saved through the administration of a drug specific for the worm. It has been named "Blanchon" after the French Canadian word for a nearly-white Beluga on the threshold of adulthood.

In May, the helicopter-lift methods devised for seals paid off in moving Olaf, our just-mature male Atlantic Walrus, from his temporary quarters in the Tripool to the new Polar Bay. With some difficulty, Olaf was lured into a huge cargo net and then lifted from the ground by a forty-foot crane. Ordinarily one would expect such a restrained animal to struggle violently and perhaps injure itself in the process. However, the seal operation showed us that, once lifted from the ground, seals do not struggle in nets, but lie quiet. This was also the case with Olaf. By means of a specially-designed dynamometer interposed between crane and cargo net, Olaf was weighed while being moved and was found to weigh 1,890 pounds. This was the first live-weight recorded for so large a walrus and proved our contention that Olaf is the only walrus his age to grow at a rate equal to that of a wild animal, a fact we attribute to a life in salt water and a diet largely of clams.

In October, quite by surprise, a new species was added to the Aquarium marine mammal collection. A yearling female Fur Seal, *Callorhinus ursinus*, and called "Gina" by us, had arrived from the Pribilof Islands in Alaska and was unclaimed at Idlewild Airport. This is the species that was nearly exterminated in the last century and was saved by international treaty signed fifty years ago. (The late Dr. C. H. Townsend, a former Director of the New York Aquarium, was the American representative in this conservation development). We claimed the animal and it has proved to be an engaging and active creature, seldom leaving the water except to take food from its tankman. This is the first fur seal, to our knowledge, to be kept exclusively in sea water and the first, in the estimation of a Fish and Wildlife Service expert on the species, to appear "normal" as to growth and form. This species has proved difficult to keep and one reason might be lack of cold, clean sea water at most facilities.

Though we now support the largest collection of marine mammals ever put under one "roof" (see Census), the picture last year was not without losses, all of them tragic, and all sudden, except the lingering sickness of Ookie, the Pacific Walrus. In early January, one of our two female Beluga Whales died after a period of fasting. The cause, upon autopsy, turned out to be a pulmonary thrombosis, the clot involved being almost four inches long and lodged in the lower lobe of the left lung. Circulatory difficulties had followed the establishment of this clot with the result that there was a great accumulation of coelomic fluid which made it impossible for the animal to eat. The cause of this clot is not known, but it was obviously of long standing. In November, the second female ceased to feed properly and died. Treatment and handling had proved extremely difficult, but autopsy showed severe gastritis, enteritis and perforated pyloric ulcers with infectious pneumonitis as the immediate cause of death. A few lung nematode worms were also present and the left adrenal was enlarged. These two deaths demonstrated that, in spite of appearance of placidity, this species is actually as delicate as the smaller porpoises have proved to be. Their capture, handling and treatment require great care and we are devising methods to satisfy these requirements.

One of the consistent problems, particularly with such "lovable" animals as walruses, is visitor-animal relations. On August 23, our large fifteen-month old 750-pound male Pacific Walrus "Seeku" suddenly died without warning. The reason appeared to be circulatory complications following the ingestion of a variety of small foreign objects obviously thrown into his pool by visitors. Seeku had gained 610 pounds on the diet we have devised for these infant animals, but he also was a typical walrus vacuum cleaner as far as objects thrown into his pool were concerned. "Murder by Litterbug" ran one local headline. The headline and article, enlarged, is on display at the Aquarium door as warning to our visitors. Extra guards are on duty to try to prevent any recurrence.

Ookie, since the age of a year and a half, had suffered from another typical walrus complaint—tusk wear and abcess. This is a particularly difficult infection to treat since nothing is known about the proper drugs to be used for walrus anesthesia and without anesthesia, X-rays cannot be taken and operative methods cannot be used. The infection was kept under control by the use of antibiotics, but after almost two years, Ookie died. She had lost appetite and had not grown in weight for a year before her death. Autopsy showed that the tusk abcess had involved the sinuses, with erosion of the turbinate bones and tusk alveoli. This was the hardest loss the New York Aquarium has had to bear at Coney Island, for Ookie was world renowned for her antics, and is the first Pacific Walrus ever to grow at normal rates; the first to "prove" our new formulas now used for rearing infant pinnipeds; and the first ever to survive captivity for over a year. She was three years and five months at death.

Genuine sea serpents were exhibited this year in the form of the Banded Sea Snake, *Hydrophis cyanocinctus*. Some of the individuals were almost six feet long and their size, activity and banded coloration combined to produce a striking display.

The Humboldt Penguins once again produced eggs and once again these were broken before hatching. One cause was the tossing of stones at the sitting bird by visitors in order to move the bird and observe the eggs. Steps have been taken to protect them.

Through exchanges and shipments from the Vancouver Public Aquarium, the Steinhart Aquarium and Marineland of the Pacific, we have received some magnificent Pacific coast fishes, starfishes and spectacular anemones of several colors and kinds. The latter have survived particularly well and mortality has been almost non-existent. By coincidence, the 53° water from our wells is almost exactly the ambient temperature of large sections of that comparatively cold coast.

Also from the Vancouver Public Aquarium in March came a thirty-pound Pacific Giant Octopus, *Paroctopus appollyon,* a species which grows to at least 34 feet in tentacle stretch and 250 pounds in weight. This individual had been captured by SCUBA divers the previous October at a weight of only five pounds. It survived with us until late summer on a diet of crabs. With the completion of our refrigeration system to meet this species' temperature requirements of less than 50°, we hope to be able to display it the year round.

With improved control over parasites of fishes, we have broadened the collection with more of the exotic oddities that are being made available by ever-improving capture and transportation techniques. A fish that has come in in some numbers has been a boon in the control of certain ectoparasites. This is the "rainbow" or "neon" wrasse, *Labroides dimidiatus,* a small blue, black and white fish which is an efficient "parasite picker." The fish picks over its tankmates constantly, even entering mouth and gills, eating parasites and appearing to have a beneficial effect on minor cuts and abrasions. Atlantic and Pacific reef fishes are cleaned with the full cooperation of the beneficiary.

In July, the Aquarium once again received a select group of Bermuda fishes, collected by Dr. and Mrs. Henry Clay Frick, II, and aided by the Bermuda Government Aquarium. Unquestionably, the prizes were two Blue Parrotfish or Clamacore, *Scarus coeruleus*, a species which has long eluded collection. This is one of the most beautiful of the parrotfishes. Special handling during capture and shipping paid off handsomely and the pair arrived in good shape with a fine group of the larger Rainbow and Purple Parrotfishes. A very large Blackfin Rockfish was also in the shipment—all in all 78 specimens of 20 species.

The Quebec Aquarium sent us on exchange some large Atlantic Sturgeon, Bowfin, Long-nose Gar, large Atlantic Salmon and a spectacular Atlantic Wolffish, *Anarichthyes lupus.*

Collections were made locally, largely at the pound nets of the Sunrise Fish Company off western Fire Island, New York. We concentrated not only on local smaller fishes, but also on the Atlantic Bonito, *Sarda sarda.* This is a species of tuna, extremely fast-moving and difficult to maintain in fish-transporting boxes. It proved possible, with chemical buffering of the water, to transport some to the Aquarium and we believe that with the larger facilities of Shark Hall we will be able to exhibit this handsome and active game fish.

Local volunteer collectors donated a variety of fishes, as usual, but this year was notable for the abundance and variety of tropical species that came into our waters in summer as juveniles. Outstanding were several young African Pompano, *Alectis crinitus,* formerly thought to be a separate species and called "Threadfish" because of the long extensions of the dorsal and anal fins. Several moderately large Striped Bass, *Roccus saxatilis,* were also caught and exhibited. As an experiment, basses up to 14 pounds were placed in the Oceanic Tank with the Beluga Whales which promptly and unexpectedly ate them.

Among the outstanding small fishes received from shipments were: Bird Wrasses, *Gomphosus* sp., Moorish Idols, *Zanclus cornutus,* and Shrimpfish, *Centriscus strigatus,* all from the Indo-Pacific. The first two species have survived remarkably well in a Pacific Reef tank isolated from other circulations. A new drugging technique for the capture of small reef fishes has brought us an excellent variety of Florida reef species, among which were the delightfully amusing Yellowhead Jawfish, *Opisthognathus aurifrons;* Spotfin Hogfish, *Bodianus pulchella;* and a variety of brightly-colored miniature basses of the genus *Serranus.* SCUBA diving techniques have been responsible for great strides in collection as well as in the science of underwater ecology and ichthyology. One species discovered in the Exuma Cays Land-and-Sea Park in the Bahamas by Dr. John E. Randall when on a New York Zoological Society-sponsored expedition for the establishment of that park, was drugged at a depth of 110 feet by Dr. Ray in November, then brought to the surface and to the Aquarium where it lived almost two months. This species is *Gramma malacara,* one of the fairy basslets which have become popular aquarium fishes since the advent of diving. We can expect these new methods to bring increasingly interesting species in the near future.

Among several miscellaneous shipments and exchanges of fishes mentioned above have been the shipment of Common Killiefish, *Fundulus heteroclitus,* Toadfish, *Opsanus tau,* and Electric Eels, *Electrophorus electricus,* to the Cleveland Memorial Hospital; and others to Department of Zoology, University of Michigan; Johnson Laboratory, University of Pennsylvania Department of Biology, New York University; Columbia University College of Physicians and Surgeons and Department of Physiology, Albert Einstein Medical School, for biological and medical research. Many of our fishes and invertebrates and some tankage has also been devoted to research at the Aquarium.

FACILITIES

Attendance for 1962 totaled 382,305, a 67% increase over last year. All facilities showed a substantial profit, the best for a full year's operation since the Aquarium's opening. Facilities included the Restaurant and Picnic Area, parking field, souvenir sales, publication sale, fish sales (to the public for feeding to the seals and walrus), headset rental and certain items of miscellany.

A new Picnic Area was opened for the warmer months and showed a profit in its first seasonal operation. The rental of headsets was discontinued in September, however. This "talking label" system was installed in 1957 and proved to be of mixed value due to the great difficulty of electronic operation in the wet and salty atmosphere of an aquarium.

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Dr. Stempien

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Dr. Baslow

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Dr. Goreau

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Dr. Jakowska

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Dr. Kallman

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Personnel

Director Coates attended the Annual Convention of the International Union of Zoo Directors in San Diego in September. He was reappointed Advisory Editor on Ichthyology for *The Encyclopedia Americana.* He also was reappointed Research Associate in the Department of Ichthyology, American Museum of Natural History, for a three-year period.

Curator Atz was elected to the Board of Governors, Class of 1967, of the American Society of Ichthyologists and Herpetologists. He was reappointed Lecturer in Biology at New York University where he again gave a course on Fish Genetics in the Graduate School of Arts and Science.

Associate Curator Ray attended the Fourth Annual Meeting of the Bahamas National Trust in Nassau in November where he was reelected Secretary. He spoke on underwater parks and sanctuaries at the First World Conference on National Parks at Seattle, Washington, in June and the subject of this talk led to a resolution calling for the establishment of underwater sanctuaries on a world basis and the extension of national seashores to include a part of the underwater realm. As an officer of the newly-founded American Littoral Society, Dr. Ray initiated monthly seminars on marine biology and oceanology for the New York Chapter at the Aquarium. These were well-attended and it is hoped that they will serve as a model for similar seminars of the ALS in other chapters in the nation.

In March Dr. Nigrelli organized a symposium in the Section of Biology and Medicine of the New York Academy of Sciences on "Antimicrobial substances from marine organisms," and gave the keynote address on "The role of antibiosis in the sea." In June he participated in the First International Conference on Wildlife Diseases at High View, New York. This conference was organized by the Wildlife Diseases Association, supported by the National Institutes of Health, and conducted under the auspices of the American Institute of Biological Sciences. In July Dr. Nigrelli attended an informal conference on "The ecological aspects of radioactive fallouts" at the Hudson Institute, Harmon-on-Hudson, New York. In October he and Dr. Ray attended the World Conference of Underwater Activities in London, sponsored by the British Sub-Aqua Club and with coordination with the Confederation Mondiale des Activites Sub-Aquatiques, Commdt. J.-Y. Cousteau, President. With Dr. Ray, he visited the Plymouth Aquarium, which has been completely rebuilt. Dr. Nigrelli went on to the Stazione Zoologica at Naples where he undertook some preliminary studies on the pharmacological properties of certain bryozoans. Dr. Nigrelli was reappointed as Ichthyopathologist at the Beth Israel Hospital for another year.

RESEARCH AND REPORT OF THE LABORATORIES

Aquarium Laboratory. Ross F. Nigrelli, *Pathologist.*

1. *Pathological Studies of Fishes.* No deaths of unusual causes occurred in 1962. The two potential major diseases, oodiniasis and benediniasia, are kept under control, where necessary, by the use of low concentration of copper ion. The laboratory has undertaken a long-term study of the relation of captivity to certain degenerative diseases of the liver, spleen, kidney and heart. One consistent feature so far has been the deterioration of the liver through fatty infiltration, ceroid deposition, haematochromatosis, hemosiderosis and cirrhosis. These may be due to the accumulation of toxic metabolites in closed circulations.

2. *Pathological Studies on Marine Mammals.* With the cooperation of Dr. William Antopol, Fellow of the New York Zoological Society and Director of Pathology and the Laboratory of Beth Israel Hospital, complete autopsies were made on all marine mammals that died in the last year, with the mentioned causes of death. The organs were processed for detailed studies by the Pathology Department of Beth Israel Hospital.

Laboratory of Marine Biochemistry and Ecology. Ross F. Nigrelli, *Chairman,* and Martin F. Stempien, Jr., *Senior Investigator.*

1. *Studies on Sponges with No Apparent RNA.* These studies were supported by grants from the Damon Runyon Memorial Fund (DRG-543 and DRG-543A). Histochemical investigations on this problem

corroborated the original biochemical observations of the apparent anomaly in which small amounts of RNA, proportionate to DNA, are found in the sponge *Cryptotethya crypta* from Bimini.

2. *Studies on Pharmacologically Active Compounds from Marine Organisms.* These investigations are being supported by a three-year grant of $266,400 from the John A. Hartford Foundation. The initial appropriation of $86,400 was presented to the Society by Ralph W. Burger, President of the Foundation, in June of this year. The research program was officially started on September 1 and three investigators were added to the staff of the laboratory with two more to follow at a later date. The investigators are: Martin F. Stempien, Jr., Ph.D., organo-biochemist and senior investigator, Morris Baslow, Ph.D., and Vincent Liguori, M.S.

The first stage of this program deals with the antibiotic, toxicological, pharmacological and biochemical properties of extracts of local and exotic marine sponges. To facilitate this program, a storage room adjacent to the main laboratory was transformed for instrumentation and research. In addition, preliminary studies on the growth-inhibiting and masculinizing, water-soluble, phrenomone (ecto-hormone) produced by the mature female *Bonellia viridis*, have shown that this substance has broader activities. Studies carried out at the Stazione Zoologica in Naples in collaboration with Dr. Pierre Tardent of the Zoological Institute, University of Zurich, revealed that the active material is composed of two chemical entities, one of which is heat stable and causes the cytolysis of fertilized eggs at stages of development up to larval sea urchin plutei, and the other heat-labile, which immobilizes sperm and ciliary movement.

Collecting trips were made to eastern Long Island, Bermuda and Naples, where sponges, sea cucumbers, byrozoans, *Bonellia* and related annelid worms, and other invertebrate forms were taken. We wish to acknowledge the advice and assistance of Dr. Peter Dohrn, Director of the Stazione Zoologica di Napoli, and Drs. F. and Anna Ghiretti and Dr. Vittorio Parisi of the same institution. Acknowledgement is also made to Dr. Pierre Tardent, Zoological Institute, University of Zurich, and to Dr. Michele Sará, Director of the Institute and Museum of Zoology and Comparative Anatomy, University of Bari, Italy, for assisting in the collection and identification of Mediterranean sponges.

Physiology of Coral Reefs. THOMAS GOREAU, *Principal Investigator*, NORA GOREAU, *Research Associate*, and ROSS F. NIGRELLI, *Consultant.*

Investigations are being made of the relation of photosynthesis and calcium carbonate production in reef-building corals and algae. These long-term studies by Dr. Goreau are being supported by a grant of $45,000 from the National Science Foundation to the New York Zoological Society, and are being made in the Department of Physiology, University College of the West Indies, Jamaica, W.I., where Dr. Goreau is Senior Lecturer (Associate Professor). Field work is carried out in the extensive reefs on the northeast of Jamaica. The program deals with possible mechanisms by which calcification and photosynthesis are linked in reef-building corals and the relation of growth and form of corals to water depth and light intensity.

Laboratory of Fish Genetics. SYLVIA GREENBERG, *Principal Investigator,* KLAUS D. KALLMAN, *Research Associate;* JUDITH FROMOWITZ, *Research Assistant;* and JAMES W. ATZ, *Consultant.*

Dr. Kallman's research was partly supported by a grant of $8,800 from the National Science Foundation under which he pursued studies of the population genetics of the Amazon Mollie, Couch's Platyfish and another closely related form from a habitat 200 miles distant. By means of his technique of fin transplantation, Dr. Kallman has been able to determine the degree of inbreeding and the structure of natural populations of these fishes. Samples of living fish for laboratory analysis were collected on field trips to Mexico and Texas in April and again to Texas in September. Dr. Kallman has found that there is a negative correlation between population size and the amount of inbreeding and also that some populations may remain stable in genetic constitution for periods of at least ten years.

This year, on a five-year grant of more than $95,000 starting 1963, for research on "Experimental Comparative Oncology of Pigment Cells," essential preliminary work was carried out. One important phase calls for the transplantation of normal and cancerous pigment cells from fish to fish and further progress was made in developing the genetic strains of fish necessary for this. The role of the pituitary gland in melanoma production in our fishes was studied by Dr. Martin P. Schreibman of New York University and Brooklyn College. His histological findings are to be extended by endocrine experiments. The pituitary extirpations and transplantations recently performed on the Amazon Mollie, a species related to our platyfishes and swordtails, have provided invaluable information on the functions of the vital gland. In these experiments, Dr. Kallman has collaborated with Drs. Madeleine Olivereau of the Institut Oceanographique in Paris, John M. Ball of the University of Liverpool, and Grace B. Pickford and Anna M. Slicher of the Bingham Oceanographic Laboratory of Yale University.

Naval Materials Laboratory. Giacomo Liberatore, *Biologist,* and Ross F. Nigrelli, *Consultant.*

Mr. Liberatore, a candidate for the doctorate at New York University, has been engaged in establishing this laboratory at the Aquarium and in preliminary work on the biology of barnacles and other fouling organisms since the opening of the laboratory in July of this year. He is employed by the New York Zoological Society through funds supplied by the Bureau of Ships, Department of the Navy, Brooklyn Navy Yard, and will be working on a problem that has confounded navies since Phoenician times—that of the fouling of ships by attached marine invertebrate fauna and flora.

General Staff

The collaboration of the New York Aquarium and the Director with Dr. David Nachmansohn, Professor of Biochemistry at the College of Physicians and Surgeons, Columbia University, and Head of the Neurochemistry Department, and his associates, is now in its 24th year. The electric organs of the Electric Eel provide an essential material for the research of this group which is investigating the biochemical and molecular basis of nerve activity. The generation and propagation of bioelectric currents in ordinary nerves which transmit messages is based on the same mechanism as the electricity of electric fishes, but the electric organs offer unusually favorable materials for biochemical analyses of the reactions underlying electrical events. The mechanism of many neurotropic agents has been elucidated by this work. Many of these play an important role in medicine, such as the local anesthetics and such muscle relaxants as curare and curare-like agents. The work of Dr. Nachmansohn on nerve gases, started during World War II, led to the development by him of a potent and effective antidote (PAM). This antidote is also efficient against insecticide poisoning and is now widely used in many countries. It has been applied on a large scale with great success in Japan where the use of insecticides is vital to preserve the rice crop and where, before the introduction of PAM, many severe casualties, frequently fatal, occurred. Thus the work of Electric Eels started at the New York Aquarium thirty years ago has led to a treatment which has saved many human lives.

Associated with Dr. Nachmansohn on these studies are Professor Sherman Beychok and Dr. H. Claire Lawler who are working on the proteins of electric tissue; Professor W-D. Dettbarn and Professor

P. Rosenberg, Mr. T. Podleski and Miss B. Bartel working on the effects of various neurotropic agents on isolated electroplax. The latter is extremely versatile, highly sensitive, and an extraordinarily potent tool for testing structure-activity relationships of neurotropic agents.

Dr. Ray completed investigations of thermoregulation in the walrus with Dr. Francis H. Fay of the Arctic Health Research Center, U.S. Public Health Service, Anchorage, Alaska. Studies on the nutrition and growth of young walrus and Hooded Seals have also been completed, the latter through the cooperation of Paul L. Montreuil, Director of the Quebec Aquarium. As a member of the Committee on Marine Mammals of the American Society of Mammalogists, a first report on the stranded cetaceans off New York and New England has been completed with William B. Schevill of Woods Hole Oceanographic Institution for publication in the Symposium on Marine Mammals of the Continental Shelf of North America. This will be the first such symposium published in North America and is an attempt to systematically record data on these, the least-known of the mammals. The British have published such symposia for a number of years. A grant of $900 was received by the New York Zoological Society from the Arctic Institute of North America for the procurement of equipment necessary for the study of thermoregulation and metabolism of pinnipeds.

Dr. Ray made a preliminary dive with members of the Oceanographic Historical Research Society of Long Island to a depth of 110 feet on the sunken ship "San Diego" for the purpose of systematically sampling attached invertebrate and algal fauna and flora. This is for the purpose of developing a program of ecological study of deep wrecks and reefs in the New York area.

Under the sponsorship of Dr. Nigrelli, George Fanelli, Jr., and Morris Baslow received the degree of Doctor of Philosophy, Department of Biology, New York University Graduate School of Arts and Science.

COLLABORATORS AND THE NATURE OF THEIR COLLABORATION WITH THE NEW YORK AQUARIUM

DR. WILLIAM ANTOPOL, Director, Pathology Department, Beth Israel Hospital, New York. Diseases and patholoy of cetaceans and other marine mammals.

DR. DAVID NACHMANSOHN AND ASSOCIATES, Department of Biochemistry and Neurology, College of Physicians and Surgeons, Columbia University. Electrophysiology of Electric Eel and other fishes.

DR. MILAN J. KOPAC, Professor of Biology, New York University. Biophysics and biochemistry of pigment formation in health and neoplastic diseases of fishes.

DR. ELI GOLDSMITH, New York University Dental College. Effects of holothurin on various biological systems.

Dr. Horace Stunkard, American Museum of Natural History. Parasitic worms in fishes and other aquatic animals.

Dr. John J. A. McLaughlin, Haskins Laboratories, New York. Analysis of "red-tide" producing toxic dinoflagellates.

Dr. Harry Sobotka and Associates, Department of Chemistry, Mount Sinai Hospital, New York. Chemical characterization of holothurin, the sea cucumber poison.

Dr. Herman Naker, Department of Physiology, Seton Hall Medical College, Jersey City. Bioassay of vitamins and amino acids in trout liver tumors.

Dr. K. France Baker-Cohen, Department of Anatomy, Albert Einstein Medical College, New York. Endocrine studies in fishes.

Dr. John Kilby, University of Florida. Parthenogenesis in fishes.

Drs. Robert R. Miller and R. Jack Schultz, Museum of Zoology, University of Michigan. Gynogenesis in fishes.

Dr. George D. Ruggieri, S.J., Woodstock College, Md. Effects of toxic metabolites from marine organisms on embryological development.

Dr. Morton Padnos, Waldemar Medical Research Institute, Port Washington, N. Y. Serological studies of protozoans.

Dr. Francis H. Fay, Arctic Health Research Center, Anchorage, Alaska. Temperature regulation, nutrition and growth of walruses.

Dr. Arnold Sparrow, Brookhaven National Laboratory, Long Island. Effects of irradiation on cold-blooded animals.

Dr. Henry Vogel, Bureau of Laboratories, Department of Health, New York. Tuberculosis in fishes and other cold-blooded animals.

Dr. Pierre Tardent, University of Zurich. Embryological effects of *Bonellin*, a growth-inhibiting and masculinizing substance from marine worms.

Dr. John M. Ball, University of Liverpool. Pituitary gland of fishes.

Dr. Nezihe Oztan, University of Istanbul. Cytology of pituitary and thyroid tumors in fishes.

Mr. Paul Montreuil, Director, Quebec Aquarium. Growth, moulting and thermoregulation of seals.

Idelisa Bonelly Calventi, M.S., Director, Marine Biological Institute of the Dominican Republic, Santo Domingo. Organization of the new institute.

Census of the Aquarium December 31, 1962

Phylum Chordata

Class Chondrichthyes—Sharks, Rays and Chimaeroids

Orders		*Species & Subspecies*	*Specimens*
Selachii	Sharks	2	7
Batoidei	Skates and Rays	1	4
Class Pisces—Fishes			
Chondrostei	Sturgeons	2	2
Isospondyli	Tarpon, Herring and allies	1	3
Holostei	Bowfins, Garpikes	1	3
Ostariophysi	Minnows, Characins, Catfishes and Electric Eel	4	20
Apodes	True Eels	6	10
Cyprinodontes	Top-minnows, Pikes	1	9
Hemibranchii	Seahorses, Pipefishes	1	7
Berycoidei	Squirrel Fishes and allies	2	20
Percesoces	Silversides, Mullets and allies	1	1
Percoidei	Perch-like Fishes	30	67
Chaetodontoidei	Butterfly and Angel Fishes	10	22
Acanthuroidei	Surgeon Fishes and allies	4	10
Chromides	Demoiselles, Clowns, Cichlids	13	56
Pharyngognathi	Wrasses and Parrot Fishes	14	24
Gobioidei	Gobies and allies	2	4
Cataphracti	Scorpion Fishes and allies	5	8
Blennoidei	Blennies and allies	4	19
Plectognathi	Puffers, Trigger Fishes and allies	9	11
Heterosomata	Flatfishes	4	12
Haplodoci	Toadfishes	1	4
Gadoidei	Codfishes and allies	2	4
Pediculati	Anglers and allies	1	1
Class Reptilia—Reptiles			
Testudines	Turtles and Tortoises	8	15
Class Aves—Birds			
Sphenisciformes	Penguins	1	10
Class Mammalia—Mammals			
Cetacea	Whales	1	2
Pinnipedia	Seals, Sealions and Walruses	9	14
Phylum Porifera—Sponges		2	15
Phylum Coelenterata			
Class Scyphozoa—Jellyfishes		1	25
Class Anthozoa—Anemones and Corals		9	61
Phylum Annelida			
Class Polychaeta—Tube Worms		2	15
Phylum Arthropoda			
Class Crustacea—Shrimp, Lobster, Crabs, etc.		4	19
Class Arachnida—Horseshoe Crabs, Spiders, etc.		1	7
Phylum Mollusca			
Class Gastropoda—Snails		2	103
Phylum Echinodermata			
Class Asteroidea—Starfish		2	27
Class Echinoidea—Sea Urchins		2	35
	Totals	165	676

Summary: Species & Subspecies, 165; Specimens, 676.

GENERAL ACTIVITIES

DEPARTMENT OF TROPICAL RESEARCH

JOCELYN CRANE, *Directing Curator*

Associates in the Trinidad Research Programs during 1962:

L. P. BROWER; J. v. Z. BROWER; C. T. COLLINS; M. G. EMSLEY;
A. A. GENEST; P. M. SHEPPARD; D. W. SNOW

ON JUNE 4, 1962, William Beebe died at Simla, the Society's Trinidad Field Station, at the age of 84. He was the Founder of the Department of Tropical Research in 1916, its Director until 1952 and, during the past ten years, its inspiring Director Emeritus. As all his friends know, he lived with enthusiasm in the midst of his work. During this year of the Department's loss, that work has gone strongly ahead. We believe that no other tribute would have pleased him more.

The principal results are these: First, related contributions appeared on bird behavior and ecology. Second, butterfly social behavior proved to depend on the relation of color to eyesight and distastefulness. Third, work in the East Indies yielded data on the geological time needed for changes in crab behavior. Fourth, a laboratory was achieved for electrophysiological research in the field.

RESEARCH

Dr. Snow, after five years of work on birds in Trinidad, spent 1962 at Oxford, preparing the results for publication. As may be seen in the list of Contributions following, five papers in the group were published; an equal number are in press. The year's work was supported by a new grant to the Society from the National Science Foundation. In June Dr. Snow presented a paper, illustrated by a color film, on comparative display in manakins, at the International Ornithological Congress at Ithaca. At year's end he left England to assume the post of Director at the Darwin Foundation's station in the Galapagos.

The butterfly work brought long-sought results. Proof came that the brightly colored helicons are not only all distasteful to their enemies, but to different degrees; the degree is determined by their relationships. The doubted mimicry of one another's colors and patterns—red-and-black, orange, yellow or blue—is a fact, giving them protection. The eyes of some closely related species are unequally sensitive to different colors. Brighter patterns in polymorphic species are genetically dominant. Finally, all of these varied characteristics of behavior, physiology and genetics are associated with the importance of colors in social behavior. The results show well the interdependence of functions in living animals, and the complexity of their evolution.

Division of work in the above program was as follows: L. P. Brower (Amherst College), distastefulness, warning coloration and mimicry; J. Crane (N. Y. Zoological Society), comparative behavior and program coordination; M. G. Emsley (Universities of London and the West Indies), comparative morphology; A. A. Genest (N. Y. Zoological Society), electrophysiology of the retina; P. M. Sheppard (University of Liverpool), genetics of polymorphism. Dr. Brower's graduate assistants were T. Pliske, J. Reiskind and G. Stiles; aides to Miss Crane, Dr. Emsley and Professor Sheppard were J. Lai-Fook, T. Lai-Fook, K. Campbell and P. Sheppard. Julie C. Emsley was scientific artist for the Department, as during the past four years.

The butterfly program was supported by National Science Foundation grants to the Zoological Society and to Amherst College for the coordinated work of J. Crane and L. P. Brower. Funds are in hand for its continuation during 1963.

Mr. Charles T. Collins of the University of Florida carried on Dr. Snow's observations on birds during the summer at Simla, and specialized on the biology and behavior of nestling swifts. Dr. Bodil Schmidt-Nielsen of Duke University and her assistant, C. Shrauger, investigated kidney function in reptiles as part of a wide-ranging study of physiology in relation to climate. All members of the group engaged in the butterfly program worked simultaneously on individual problems concerning the sensory physiology, social behavior and genetics of other insects.

J. Crane's monograph on fiddler crabs reached the final phase of manuscript preparation. A field trip to Java and the Sulu Sea filled important gaps in knowledge of the course of speciation and the time needed for changes in social behavior. Estimates were possible because of the geologically recent removal of land barriers between populations. Two hundred fiddlers were flown back to Simla alive; many survived to live for months in the crabberies, among specimens from Costa Rica, Panama and Trinidad itself. The journey was financed partly through a National Science Foundation grant and partly through the Madison Grant Fund of the New York Zoological Society.

TRAVEL

As usual, Simla also served as a base for shorter trips afield. Professor Sheppard spent two weeks in Surinam, observing for the first time on the wing the butterflies concerned in his current studies on genetics. Dr. Emsley studied museum collections in the United States and England, in connection with his work on helicon relationships. Several hundred specimens were brought back to Trinidad on loan, to be drawn and compared.

CONSTRUCTION AND MAINTENANCE

A large back room at Simla was floored with vibrationless concrete and divided into two new laboratories. One was air-conditioned, the Station's first, making electrophysiological studies possible. Both the remodelling expenses and the instruments for research were provided by the National Science Foundation grant for butterfly study. The room doubles as a photographic laboratory and storage vault.

The second room gives needed space for insect rearing and behavior study; during 1963 it will be equipped as a growth-control chamber. A newly enclosed porch provided a bedroom. Remodelling of an unused section of the garage made a laundry.

Nine new insect breeding cages, each measuring six feet on a side, met the needs of the expanded genetics program. A third tidal crabbery was constructed in the old lily pond, to accommodate fiddlers from Java and the Philippines.

The Station's three field assistants as usual served also as a maintenance crew. Some of their chores were distinctly tropical: they cut back jungle on the steep boundaries of Simla's 240 acres, scrubbed pink and green mildew from outer walls, removed 33 nests of stinging ants from the grapefruit trees and chopped down 47 burgeoning rubber, cyp and breadfruit that were spoiling the famous views.

STATION NAME

At its meeting of June 19, the Zoological Society's Board of Trustees voted that the name of the Trinidad station be changed officially to "The William Beebe Tropical Research Station."

CONTRIBUTIONS, 1962

1015. Biology and Behavior of *Damon variegatus* Perty of South Africa and *Admetus barbadensis* Pocock of Trinidad, W.I. (Arachnida, Pedipalpi). Anne J. Alexander. *Zoologica*, 47 (1): 25-37.

1016. Breeding Activities, Especially Nest Building, of the Yellowtail *(Ostinops decumanus)* in Trinidad, W.I. William H. Drury, Jr. *Zoologica*, 47 (1): 39-58.

1017. A Field Study of the Black and White Manakin, *Manacus manacus* in Trinidad. D. W. Snow. *Zoologica,* 47 (2): 65-104. (Note: This contribution was erroneously listed as No. 1015 in the foot-note on its title page).

1018. Notes on the Biology of Some Trinidad Swifts. D. W. Snow. *Zoologica,* 47 (3): 129-139.

1019. The Genetics of Some Polymorphic Forms of the Butterflies *Heliconius melpomene* Linnaeus and *H. erato* Linnaeus. I. Major Genes. J. R. G. Turner & Jocelyn Crane. *Zoologica,* 47 (3): 141-152.

1020. A Field Study of the Golden-headed Manakin, *Pipra erythrocephala,* in Trinidad, W.I. D. W. Snow. *Zoologica,* 47 (4): 183-198.

1021. The Natural History of the Oilbird, *Steatornis caripensis,* in Trinidad, W.I. Part 2. Population, Breeding Ecology and Food. D. W. Snow. *Zoologica,* 47 (4): 199-221.

1022. Notes on the Behavior of Three Cotingidae. Barbara K. Snow. *The Auk,* 78: 150-161.

1023. Social Breeding Behavior of the Mexican Tanager. David W. Snow & Charles T. Collins. *The Condor,* 64: 161.

1024. Comparative Studies of the Orientation Sounds of Bats. D. R. Griffin. Symposium of the Zoological Society of London, No. 7: 61-72.

1025. 5,000 Bugs—A Year's Work Would Fit in a Teaspoon. M. G. Emsley. *Animal Kingdom,* LXV (4): 114-116.

1026. Experimental Studies of Müllerian Mimicry in Neotropical Butterflies. (Abstract). L. P. Brower, J. v. Z. Brower & C. T. Collins. *American Zoologist,* 2: 509.

1027. William Beebe: 1877-1962. Fairfield Osborn. *Animal Kingdom,* LXV (4): 121-123.

1028. William Beebe: Zoologist and Popularizer. Anon. *New Scientist.* London, June 14.

1029. William Beebe. Vincent Roth. *Journal of the British Guiana Museum and Zoo.* June 30: 34.

1030. William Beebe. Ramon Aveledo Hostos. *Boletin Sociedad Venezolana de Ciencias Naturales.* XXIII (102): 207-208.

1031. William Beebe, Naturalist, Dies; Bathysphere Explorer was 84. *New York Times,* June 6: 2.

1032. Dr. William Beebe Dies, Plumbed Ocean Depths. *New York Herald Tribune,* June 6: 1.

1033. Dr. William Beebe, "Simla" Head, Dies. *Trinidad Guardian,* June 6: 1.

1034. Dr. Beebe's Work on Show. *Trinidad Guardian,* September 6: 1.

1035. Annual Report of the Department of Tropical Research for 1961.

DEPARTMENT OF EDUCATION

Herbert J. Knobloch, *Associate Curator*
Phyllis K. Linnemann, *Museum Instructor*
Doris S. Cellarius, *Museum Instructor*

The number of classes and organized groups visiting the Zoological Park last year showed a surprising increase that cannot be entirely explained by the fact that the Park was closed by a strike for seven weeks in the spring of 1961. In part it must be ascribed to an increased use of the Zoo as a teaching aid.

	1961	1962
Schools, Organizations and Institutions	3,329	4,290
Classes and Organized Groups	5,410	8,431
Total Class/Group Attendance	191,228	229,021

We are noticing a decided increase in the number of visits by play schools and day camps during the middle of the summer, probably reflecting the tendency of schools, churches and other organizations to expand these facilities.

Visual Aids

The Department put together three motion picture films, utilizing footage shot by the Staff Photographer and (on Dr. Dowling's Galapagos expedition) by the National Geographic Society's photographer. These were: "The Zoo Record," "A Gathering from the Sea" and "The Galapagos Today." Some of our films are distributed by the McGraw-Hill Company; rentals are handled by the Department.

Lectures and Tours

For 19 years lecturers from the Department have visited schools, hospitals and institutions with small animals; last year our two lecturers gave 375 talks before 70,724 young people—almost 30,000 more than in 1961, the best previous year. By the year's end 300 requests for the lecture service were already on file for 1963. Our small staff seldom had any free time—129 guided tours of the Zoo itself were given, as well as 11 lectures and four television and two radio appearances.

Animal Nursery

The Education Department assumed responsibility for operation of the Animal Nursery in conjunction with the Children's Zoo, staffing it with Miss Katherine Efthimion and Miss Michele Perrault, assisted by Miss Linnemann and Mrs. Cellarius. Princess Sofia and Prince Juan Carlos of Spain were among the visitors.

MISCELLANEOUS

For the sixth year New Haven Railroad trains ran special excursions to the Zoo; arrangements were made by the Department.

In-service courses for elementary, junior and senior high school teachers on "Utilization of the Bronx Zoo in the Science Program of Elementary and Secondary Schools" were conducted for the thirteenth year, and a natural history training course was given for Girl Scout leaders.

Mr. Knobloch and Dr. Dowling assisted in judging the student science exhibits at the seventh Westchester Science Fair.

PUBLICATION AND PHOTOGRAPHY

WILLIAM BRIDGES, *Curator*

DOROTHY REVILLE, *Editorial Assistant*

SAM DUNTON, *Photographer*

HENRY M. LESTER, *Photographic Consultant*

AN UNUSUAL number of special printing jobs were produced by the Department. Mrs. Reville made attractive layouts for two *Animal Kingdom* inserts, "A Report on the Scientific Work of the New York Zoological Society" and "The Work of the New York Zoological Society in Conservation and Scientific Research," designed "Report on African Wildlife" and "To All Who Care About Tomorrow," and completely made over the printed Zoo map and the Membership promotional folder, "Animals and More Animals."

She also designed the Zoo's cumulative attendance sign on the lawn beside the Administration Building and the "Dead as the Dodo" sign calling attention to endangered species.

Mr. Dunton produced two 16-minute motion pictures, "The Zoo Record" and "A Gathering from the Sea," made at the Zoological Park and the Aquarium, respectively. He turned in 619 still negatives and about 40 color transparencies. The photographic section under Mrs. Reville acquired thousands of black-and-white negatives made by Dr. Beebe on various expeditions.

Mr. Dunton conducted a "Camera Safari" at the Aquarium for the Society's Members. He continued as a Director of the Biological Photographic Association and was appointed sub-chairman of its Certification Program. In mid-year he was given the Zoological Society's gold pin for thirty years of service.

In December both *Animal Kingdom* and *Zoologica* were granted second-class mailing privileges, a classification that will lead to considerable savings on postage for the two magazines.

In the spring Mr. Bridges wrote the script for "Tiger Train" lecturer-drivers, covering the entire Zoo. Two books written by him, "Ookie: the Walrus Who Liked People" and "The Golden Book of Zoo Animals," were published.

MEMBERSHIP

GORDON CUYLER, *Membership Chairman*

THE ANNUAL mid-winter meeting at the Waldorf-Astoria in January, Curator-conducted tours of the Zoo and Aquarium in April and May, and a Garden Party at the Aquarium in June were the highlights of the year for our Members. Particularly encouraging was the response of Members to the Curator-conducted Saturday morning tours. One of the reasons for their success was the excellent audible communication achieved by means of the tractor trains' sound system and electronic megaphones.

The Membership total of 4,316 at year's end is an increase of 240 over 1961; 580 new Members were enrolled and 340—about 8% of the total Membership—were dropped.

Most of the new Members were gained through a spirited appeal to good New Yorkers in the Spring of 1962 and a Newsletter about the capture of the White Rhinoceroses in September. Membership income again increased, to $77,456—a gain of about $4,000 over 1961. With some 3,700 of our Members paying dues annually, this means that the average yearly Membership income is about $20 per Membership.

THE CONSERVATION FOUNDATION

The 1962 Annual Report of the Conservation Foundation, the affiliate of the New York Zoological Society in conservation work, may be had upon request from the Foundation's offices at 30 East 40th Street, New York 16, N. Y.

JACKSON HOLE BIOLOGICAL RESEARCH STATION

L. Floyd Clarke, *Director*

The Jackson Hole Biological Research Station at Moran, Wyoming, was established by the New York Zoological Society with a series of research studies in 1946, and is now sponsored jointly by the Zoological Society and the University of Wyoming.

The following research projects were conducted at the Jackson Hole Biological Research Station during the summer of 1962.

Margaret Altmann—The Social Role of the Aging Ungulate. Assisted by John McLeod and Steve Martin. Supported by the National Institute of Mental Health.

Robert C. Bergstrom—Trends of Vegetation in and near Six Elk Exclosures on the Northern Yellowstone Wildlife Winter Range. Supported by Yellowstone National Park.

L. Floyd Clarke—Limnological Studies on Swan Lake and Third Creek. Supported by the University of Wyoming.

Kenneth L. Diem—Some Aspects of Plant and Animal Distribution as Affected by Geologic Formations. Supported by the New York Zoological Society and the National Park Service.

Ralph W. Dimmick—Population Study of Canada Geese in Jackson Hole, Wyoming. Supported by the Wyoming Game and Fish Department.

J. Gordon Edwards—The Ecology, Taxonomy and Bionomics of Insects in the Grand Teton Area. Supported by the New York Zoological Society.

Charles C. Laing—Effect of Visitors on Alpine Ecosystems in the High Tetons.

Donald C. Lowrie—Study of Spiders of the Family Lycosidae in Jackson Hole. Assisted by Mrs. Jackie Bonquet. Supported by the New York Zoological Society.

John Merkle—Ecological Studies of the Amphitheater and Surprise Lakes in the Teton Mountains. Supported by Grand Teton National Park.

Paul G. Roofe—Some Aspects of the Blood Physiology of *Amblystoma tigrinum melanosticum*. Supported by the National Institutes of Health.

George B. Schaller—The Breeding Behavior of the White Pelican. Supported by the New York Zoological Society.

Gerald Scherba—Social Organization among Colonies in the Ant, *Formica opaciventris*. Assisted by Norman Heryford. Supported by the National Science Foundation.

MEMBERSHIP IN THE NEW YORK ZOOLOGICAL SOCIETY

THE NEW YORK ZOOLOGICAL SOCIETY was founded in 1895 for the "instruction and recreation of the people" through the establishment of a Zoological Park, for the promotion of zoology through exhibition of collections, publication, research and exploration, and for the conservation of animal life of the world. Since 1899 the Zoological Society has directed the New York Zoological Park and in 1902 it was entrusted with the management of the New York Aquarium.

MEMBERSHIP is actively invited of all persons who are interested in the objects of the Society and desire to contribute toward its support.

ANNUAL MEMBERSHIP is $15. Contributing Membership is $25. Supporting Membership is $100. These Memberships entitle the holders to Member's cards for admission and free parking at any time, and 5 guest tickets of admission (including parking) to the Zoological Park on pay days, and 5 to the Aquarium on any day; a copy of the *Annual Report;* a subscription to *Animal Kingdom,* the bi-monthly publication of the Society; privileges of the Library and Members' Lounge in the Administration Building of the Zoological Park and to attend all open meetings of the Society. Tickets to all sections of the Zoological Park for which an admission charge is made are available, free, to Members upon application at the Administration Building in person. Members will be taken on "behind the scenes" tours of the Zoological Park and Aquarium, without charge, on application, and are entitled to 20% discount on all publications of the Society. We are advised that Contributing and Supporting Membership fees are deductible from income tax within the legal limits.

LIFE MEMBERSHIP is $500. See By-laws for conversion of Annual, Contributing and Supporting to Life Membership. Other classes of membership are: Patron, $1,000; Associate Founder, $2,500; Founder, $5,000; Founder in Perpetuity, $10,000; Benefactor, $25,000.

APPLICATIONS for membership may be submitted to any officer of the Society at the Zoological Park or the Aquarium, or to the Society's general office at 630 Fifth Avenue, New York 20, N. Y.

FORM OF BEQUEST

I do hereby give and bequeath to the "New York Zoological Society," of the City of New York..............................

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FINANCIAL STATEMENTS

NEW YORK ZOOLOGICAL SOCIETY

BALANCE SHEET • December 31, 1962

ASSETS

Cash in banks and on hand		$ 519,105.03
Investments (quoted market value $9,656,986.16)		7,908,194.09
Receivables:		
City of New York	$ 238,044.35	
Other	4,305.50	242,349.85
Inventories, at cost:		
Park facilities	32,670.82	
Aquarium	10,014.96	42,685.78
Facilities' assets, at cost less depreciation:		
Zoological Park (note 1):		
Improvements to land and buildings	264,239.64	
Equipment and miscellaneous items	46,941.62	
	311,181.26	
Aquarium equipment and miscellaneous items	14,460.00	325,641.26
Prepaid expenses and deferred charges		26,628.02
National collection of heads and horns, art gallery, library and sundry items		1.00
Collection of living animals		1.00
Jackson Hole Research Station buildings		1.00
Simla Tropical Research Station		1.00
		$9,064,608.03

LIABILITIES

Accounts payable and accrued expenses		148,606.77
Payable to the City of New York		3,934.44
Fund reserves:		
General	6,087,812.12	
Endowment	2,006,670.72	
Special Purpose	350,970.18	
Park Facilities Operating	466,161.65	
Aquarium Development	452.15	
		8,912,066.82
		$9,064,608.03

See accompanying notes to financial statements.

STATEMENT OF GENERAL INCOME AND EXPENSE

Year ended December 31, 1962

Income:		
Income from investments		$ 360,693.11
Annual dues		77,431.50
Sales of publications and photographs		7,086.15
Gifts		14,670.00
Portion of grants for operating costs		13,875.87
Miscellaneous income		12,724.83
		$ 486,481.46
Expense:		
Actuary and appraiser fees		2,705.50
Annual report		3,438.64
Aquarium research		8,167.26
Audit fees		2,677.00
Custodian fees		3,361.98
Educational activities		26,783.34
Employee welfare		3,276.43
Executive office		52,273.57
Group life insurance		8,325.82
Hospitalization		26,596.78
Insurance		7,242.25
Legal fees		4,875.00
Library		1,683.33
Membership activities		27,836.33
Membership promotion		7,443.69
Pensions:		
Fund contribution—150% of employee contributions	$ 46,407.70	
Auxiliary payments	1,632.84	48,040.54
Publication expenses:		
Salaries and other expenses	42,126.77	
"Animal Kingdom"	18,524.21	
"Zoologica"	10,263.76	70,914.74
Reception expense		3,614.89
Social security taxes		3,635.13
Traveling expense		2,327.12
Tropical research		14,759.67
		329,979.01
Park maintenance expenditures	1,240,811.16	
Less amount provided by New York City	1,065,315.48	
Amount expended by New York Zoological Society		175,495.68
Deficit carried to General Working Fund		(18,993.23)
		$ 486,481.46

See accompanying notes to financial statements.

GENERAL WORKING FUND

Statement of Changes
Year ended December 31, 1962

Balance at beginning of year		$ 133,860.77
Add:		
Gifts and legacies	$ 86,326.12	
Life memberships	2,900.00	
Conservation film royalties	6,007.26	
Pro rata share of net gain on investment transactions	1,346.05	96,579.43
		230,440.20
Deduct:		
Grants and contributions:		
The Conservation Foundation, Inc.	20,000.00	
Department of Tropical Research, Trinidad, W.I.	11,850.00	
Jackson Hole Biological Research Station for research and expenses	2,090.00	
Lee S. Crandall for publication on care and exhibition of wild animals in captivity	3,499.92	
Pacific Science Board of The National Research Council	750.00	
Honorarium—Dr. L. Floyd Clarke	500.00	
Other:		
Appropriated for Aquarium development	7,714.48	
Expenses incurred in establishing new executive office	4,562.79	
Transfer to special projects fund reserve	757.70	
Legal costs on legacies	200.00	
	51,924.89	
Deficits:		
General income and expense	18,993.23	
Aquarium operations	21,825.65	
		92,743.77
Balance at end of year		$ 137,696.43

See accompanying notes to financial statements.

GENERAL DEVELOPMENT FUND

Statement of Changes
Year ended December 31, 1962

Balance at beginning of year		$ 211,307.66
Add:		
Gifts		770,917.47
Transferred from Building Fund		1,000.00
		983,225.13
Deduct:		
Appropriated for Aquarium development—walrus pool complex	$ 41,300.00	
Expended from The John A. Hartford Foundation grant for studies on pharmacologically active compounds derived from marine organisms.	18,536.53	
Fund raising campaign office expenses	17,179.77	
Remodeling Aquarium laboratory	2,263.44	
Prints of film "Visit to a National Park"	1,063.56	
		80,343.30
Balance at end of year:		
Unrestricted uses	609,606.92	
New York Zoological Park uses only	100,000.00	
New York Aquarium uses only	5,100.00	
Planting and landscaping in the New York Zoological Park	6,375.00	
Scientific purposes only	3,936.44	
The John A. Hartford Foundation grant	67,863.47	
Doris Duke Foundation grant for production of educational films	10,000.00	
Marine Biological Laboratory	50,000.00	
Wildlife Survival Center	50,000.00	
		$ 902,881.83

See accompanying notes to financial statements.

AQUARIUM DEVELOPMENT FUND

Statement of Changes
Year ended December 31, 1962

Fund balance at beginning of year	$ 50,962.61
Add appropriations from the general funds of the Society	49,014.48
	99,977.09
Deduct expenditures during year for construction of additional facilities and exhibits	99,524.94
Fund balance at end of year	$ 452.15

See accompanying notes to financial statements.

NEW YORK AQUARIUM

Statement of Income and Expense and Operating Reserve Fund

Year ended December 31, 1962

Aquarium operations:			
Admissions			$ 233,869.80
Miscellaneous income			1,321.27
			235,191.07
Less:			
Salaries and wages		$ 237,406.23	
Less amount provided by New York City		34,460.57	
		202,945.66	
Supplies, materials, equipment and services		58,172.70	
Administration costs	$ 55,321.78		
Less amount provided by New York City	852.37	54,469.41	
Collections		4,157.00	319,744.77
Loss from operations			(84,553.70)
Aquarium facilities:			
Receipts from sales and services		153,109.36	
Less:			
Cost of merchandise sold	44,594.43		
Operating and maintenance supplies	10,193.76		
Salaries and wages	35,593.12	90,381.31	
Profit from facilities			62,728.05
Net loss			(21,825.65)
Deficit carried to General Working Fund			21,825.65
Fund balance at beginning and end of year			$ —

See accompanying notes to financial statements.

PARK FACILITIES

Statement of Income and Expense and Operating Fund
Year ended December 31, 1962

Receipts from sales at restaurants, stands, etc. and from services			$1,301,995.62
Less:			
Cost of merchandise sold		$ 349,330.30	
Salaries and commissions		550,549.39	
Operating and maintenance supplies		110,508.73	
Depreciation		31,491.42	
Comprehensive public liability insurance		15,090.09	
Other operating and general expenses		46,321.64	1,103,291.57
Net income from sales at restaurants, stands, etc. and from services (note 1)			198,704.05
Fund balance:			
Balance at beginning of year		407,457.60	
Deduct:			
Appropriations for park improvements	$ 70,000.00		
Appropriations for the purchase of animals	70,000.00	140,000.00	
			267,457.60
Balance at end of year			$ 466,161.65

See accompanying notes to financial statements.

PERMANENT WILDLIFE PROTECTION FUND

December 31, 1962

Amount due from New York Zoological Society		$ 1,952.36
Investments, at book value (quoted market value $225,313.75)		186,424.14
Amount of Fund at beginning of year	$ 187,725.50	
Add net gain on investment transactions	651.00	
Principal Fund at end of year		$ 188,376.50

GIFTS, GRANTS AND LEGACIES RECEIVED

Year ended December 31, 1962

General Working Fund:				
George F. Baker, Jr.				$ 1,176.07
Laurance S. Rockefeller				53,150.00
Estate of George H. Semken				5,093.16
Estate of J. Watson Webb				26,906.89
				86,326.12
General Development Fund:				
Douglas H. Alexander			$ 500.00	
Mrs. Vincent Astor			10,000.00	
George F. Baker Trust			20,000.00	
George F. Baker, Jr.			9,796.88	
Howel H. Barnes, Jr.			100.00	
Mrs. August Belmont			560.70	
Mrs. George K. Bennett			100.00	
Mr. & Mrs. Robert E. Blum			2,500.00	
Anna R. Butler			502.29	
Mrs. Henry G. Byng			250.00	
C. A. L. Foundation, Inc.			1,000.00	
The C. T. Foundation			250.00	
Mrs. Eleanor Rixson Cannon			100.00	
Percy Chubb			250.00	
The Clark Foundation			5,000.00	
Mr. & Mrs. Robert Clarkson			100.00	
The Coe Foundation			20,000.00	
William Rogers Coe			10,000.00	
Mr. & Mrs. Randolph P. Compton			125.00	
Ursula Corning			500.00	
C. Suydam Cutting			4,687.30	
E. W. Debevoise			100.00	
C. Douglas Dillon			3,171.87	
Mr. & Mrs. Donald D. Dodge, Stonehurst Foundation			500.00	
Dr. & Mrs. Wilbur G. Downs			100.00	
Doris Duke Foundation			10,000.00	
John Elliott			1,000.00	
Alexander E. Eltz			100.00	
Childs Frick		$ 36,342.25		
Less amounts authorized for other organizations:				
Bermuda Aquarium and Museum	$5,500.00			
Bermuda Audubon Society	1,500.00			
Bermuda Biological Station for Research	2,000.00			
The Conservation Foundation, Inc.	7,000.00	16,000.00		
			20,342.25	
Carried forward			$ 121,636.29	86,326.12

Brought forward		$ 86,326.12
General Development Fund, continued:		
Brought forward	$ 121,636.29	
Dr. H. Clay Frick II	12,101.44	
Paul E. Geier	500.00	
Mrs. Benjamin D. Gilbert	500.00	
Bernard F. & Alva B. Gimbel Foundation	5,000.00	
Charles M. Grace	250.00	
The Griffis Foundation Inc.	100.00	
Peter Grimm	1,000.00	
W. E. S. Griswold	1,000.00	
Stanley Hart	100.00	
The John A. Hartford Foundation Inc.	86,400.00	
Irene Hayes	200.00	
Mrs. S. B. Healy	100.00	
Audrey S. & Thomas B. Hess Foundation, Inc.	100.00	
Mrs. Dorothy Hirshon	400.00	
Eugene Holman	500.00	
Mrs. Anna H. Huntington	100.00	
Warren Kinney	5,000.00	
Virginia W. Kress	300.00	
Mr. & Mrs. James F. Lawrence	100.00	
Hon. Herbert H. Lehman	1,000.00	
Edith & Herbert H. Lehman Foundation	1,000.00	
Mr. & Mrs. Dulaney Logan	470.00	
Mrs. Robert London	100.00	
Mortimer & Harriet M. Marcus Foundation Inc.	1,000.00	
Mrs. Cordelia Scaife May	9,039.31	
Thomas C. Mayers	100.00	
Mr. & Mrs. David H. McAlpin	8,156.25	
Merck Family Fund	3,500.00	
Morris Natelson	510.00	
Aaron E. Norman Fund	375.00	
Fairfield Osborn	2,000.00	
Mr. & Mrs. Richard C. Paine	1,000.00	
Carl W. Painter	100.00	
Katherine de B. Parsons	1,000.00	
Richard Peyton Charitable Trust of 1956	1,000.00	
Howard Phipps Foundation	20,000.00	
Miss Joanna Pierce	300.00	
John Pierrepont	5,000.00	
Carried forward	$ 291,038.29	86,326.12

Brought forward		$ 86,326.12
General Development Fund, continued:		
Brought forward	$ 291,038.29	
W. T. Rasmus	300.00	
Mrs. Belle Trimble Ray	100.00	
Reader's Digest Foundation	2,500.00	
Willis L. M. Reese	200.00	
Target Rock Foundation	250.00	
Godfrey S. Rockefeller, Mad River Foundation	100.00	
Laurance S. Rockefeller	313,212.50	
Mrs. William P. Roth	200.00	
Adolf H. Rust	300.00	
Mrs. Alan M. Scaife	100,000.00	
Richard Shields Charitable Trust	500.00	
John M. Schiff	5,000.00	
W. J. Schieffelin, Jr.	500.00	
Mr. & Mrs. Clarence J. Schoo	500.00	
Edward A. Schrader Foundation	100.00	
Mrs. Magda Merck Sheldon	1,023.75	
Mrs. Sidney Spivack (The Bedminister Fund)	1,000.00	
Chauncey Stillman Charitable Trust	5,000.00	
Mrs. Roger W. Straus	500.00	
Mrs. Arthur H. Sulzberger	250.00	
John Tee-Van	1,000.00	
Martha P. & Joseph A. Thomas Foundation	5,000.00	
The Thorne Foundation	5,000.00	
Catherine Breyer Van Bomel Foundation	100.00	
Alfred G. Vanderbilt	5,000.00	
Miss Joan Van Orden	100.00	
Howard A. Van Vleck	100.00	
John B. Watkins	100.00	
Webster Benevolent Foundation	500.00	
Orme Wilson	500.00	
Mr. & Mrs. John Winslow	200.00	
Robert Winthrop	2,500.00	
Arnold Witridge	100.00	
Anonymous	22,500.00	
Anonymous	1,000.00	
Anonymous	662.63	
Anonymous	100.00	
Others (under $100.00)	3,880.30	
		770,917.47
Carried forward		$ 857,243.59

Brought forward		$ 857,243.59
Conservation Account—Helen W. Hansen		100.00
African Wild Life Fund:		
Alexander H. Bright	$ 200.00	
The J. Frederick Brown Foundation	900.00	
Mrs. C. Reed Carey	100.00	
Frederick C. Church Foundation	1,000.00	
Daniel Foundation	1,000.00	
Jaques de Wolfe	100.00	
Bayard Ewing	100.00	
Gardener Charitable Trust	1,000.00	
Russell Grinnell	1,000.00	
Henry S. Hall, Jr.	200.00	
Warren Kinney	1,000.00	
Robert Leeson	500.00	
Arthur D. Little Foundation	1,000.00	
The Little Foundation	4,600.00	
Royal Little	25,128.31	
Mrs. E. F. Maude	100.00	
Richard C. Paine	250.00	
James S. Pass	300.00	
Miss Amelia Peabody	100.00	
Mrs. R. Stuyvesant Pierrepont	100.00	
Mrs. Alan M. Scaife	5,000.00	
Mason Sears	280.00	
Mrs. Henry D. Sharpe	1,000.00	
Mrs. Albert Spaulding	550.00	
Robert G. Stone	2,500.00	
Mrs. Arthur H. Sulzberger	250.00	
Martha P. & Joseph A. Thomas Foundation	1,000.00	
Anonymous	100.00	
Others (under $100.00)	295.00	49,653.31
Arctic Institute of North America Grant		450.00
Bahamas National Trust Fund:		
Mr. & Mrs. Robert E. Blum	1,000.00	
Hume Cronyn	1,000.00	
Mrs. Thomas Hitchcock	1,000.00	
Alexander M. & Judith W. Laughlin Foundation	1,000.00	
Belle Trimble Ray	100.00	
William Simpson	100.00	
W. W. Smith Foundation	2,000.00	
Mary L. Sullivan	100.00	
Richard I. N. Weingart	1,312.50	
Others (under $100.00)	354.00	
		7,966.50
Carried forward		$ 915,413.40

Brought forward		$ 915,413.40
Ford Foundation Grant for Conservation Education in Tanganyika		10,000.00
Fund for Conservation Education in Tanganyika:		
Richard M. Scaife	$ 5,250.00	
The Scherman Foundation	2,500.00	
Mrs. Eugene Victor Thaw	500.00	
Others (under $100.00)	50.00	8,300.00
Madison Grant Scientific Research Fund—Estate of Deforest Grant		35,139.38
National Institutes of Health		60,740.00
National Science Foundation		72,100.00
Special Projects Fund:		
Nixon Griffis	627.00	
Thomas J. Morrison, M.D.	1,000.00	
Mrs. Axel G. Rosen	100.00	
G. L. Tawney	800.00	
Time, Inc.	250.00	
Others (under $100.00)	117.00	2,894.00
Total		1,104,586.78
General income:		
The Chase Manhattan Bank Foundation	1,000.00	
Childs Frick	5,000.00	
New York Times Foundation Inc.	1,000.00	
Rockefeller Brothers Fund	5,000.00	
Rockefeller Center Inc.	2,500.00	
Anonymous	100.00	
Others (under $100.00)	70.00	
		14,670.00
		$1,119,256.78

NOTES TO FINANCIAL STATEMENTS

(1) Park Facilities' assets are subject to an agreement with the City of New York, and the net income from Park Facilities' operations may be used only for the purchase of animals and the improvement of Zoological Park.

(2) The balance sheet does not include the assets and liabilities of The Pension Fund.

(3) The New York Zoological Society and the City of New York have agreed to construct an Aquarium, as funds become available, at an estimated total cost (to be shared equally) of $7,100,000.00, of which the initial stage ($1,565,134.00) was completed May 31, 1957.

(4) The Society and the City of New York have agreed to construct a new Aquatic Bird House at the New York Zoological Park at an estimated total cost (to be shared in a 25/75 ratio) of $481,600.00. At December 31, 1962 disbursements totaled $21,493.20, of which the Society's share was $6,763.20.

THE PENSION FUND

(Founded by Andrew Carnegie)
Statement of Cash Transactions
Year ended December 31, 1962

Balance at beginning of year:				
Investments (quoted market value $2,340,621.27)				$1,891,691.90
Uninvested balance of cash				78,511.71
Accrued interest purchased				113.47
				1,970,317.08
Receipts:				
Income from investments:				
Interest			$ 38,206.24	
Dividends			56,538.70	
			94,744.94	
Contributions by employees:				
Regular		$ 45,267.71		
Special		5,123.60	50,391.31	
Contributions by New York Zoological Society:				
Society		46,751.51		
Facilities		11,647.63		
Aquarium		10,099.64	68,498.78	
				213,635.03
				2,183,952.11
Expenditures:				
Refunds on account of resignations			6,596.75	
Pension disbursements			51,771.32	
Pension payments to heir of deceased employee			168.86	58,536.93
				2,125,415.18
Net gain on investment transactions				26,536.98
	Value			
	Market	Book		
Balance at end of year:				
Investments:				
Bonds	$1,039,403.76	1,040,992.72		
Preferred stocks	291,782.50	300,913.93		
Common stocks	1,169,528.67	742,072.50		
	$2,500,714.93		2,083,979.15	
Accrued interest purchased			94.44	
Uninvested balance of cash			67,878.57	
				$2,151,952.16

PEAT, MARWICK, MITCHELL & CO.
CERTIFIED PUBLIC ACCOUNTANTS
Seventy Pine Street
New York 5, N. Y.

ACCOUNTANTS' REPORT

THE BOARD OF TRUSTEES
NEW YORK ZOOLOGICAL SOCIETY:

We have examined the balance sheet of New York Zoological Society as of December 31, 1962 and statements of the transactions of the various funds of the Society, including the schedules in support of such statements, and of The Pension Fund for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. It was not practicable to confirm the receivable from the City of New York by communication with it, but we satisfied ourselves as to the account by means of other auditing procedures. As to gifts, grants and legacies, it was not practicable because of their nature to extend the examination beyond accounting, on a test basis, for the receipts as recorded.

In our opinion, the accompanying balance sheet and statements of transactions of the various funds of the Society, together with the supporting schedules, present fairly the financial position of the Society at December 31, 1962 on the basis stated therein, and the changes in the funds of the Society for the year then ended, in conformity with generally accepted accounting principles applied on a basis consistent with that of the preceding year.

PEAT, MARWICK, MITCHELL & CO.

New York, N. Y.
February 26, 1963

SUMMARY OF EXPENDITURES, 1896 to 1962, New York Zoological Society and the City of New York, on Account of the Development and Maintenance of the Zoological Park and the Aquarium, Including the Purchase of Collections and Also for the Scientific and General Purposes of This Society.

	EXPENDED BY THE CITY OF NEW YORK			FROM GATE RECEIPTS		EXPENDED BY THE NEW YORK ZOOLOGICAL SOCIETY									
Year	Zoological Park Maintenance	Aquarium Maintenance	Bond Issues a/c Park & Aquarium	Construction and Repairs	Purchase of Animals	Zoological Park Development	Aquarium Improvements	Zoological Park Maintenance	Aquarium Maintenance	Purchase of Animals	Aquarium Specimens	Heads and Horns Collection	Pension Fund Contribution	Library and Paintings	Scientific and General Purposes
1896	....	....	....	....	....	$ 4,213.63	....	....	....	....	....	....	....	....	....
1897	....	....	....	....	....	6,424.61	....	....	....	....	....	....	....	....	$ 2,903.74
1898	....	....	....	....	....	23,597.80	....	$ 1,292.16	....	....	....	....	....	....	4,339.20
1899	$ 30,000.00	....	....	....	....	145,495.80	....	7,038.61	....	$ 8,540.72	....	....	....	$ 102.76	3,476.02
1900	40,000.00	....	$125,000.00	....	$ 2,470.88	34,626.24	....	6,189.33	....	3,784.32	....	....	....	88.13	5,601.78
1901	65,000.00	....	300,000.00	....	2,998.80	18,348.61	....	3,714.37	....	11,652.24	....	....	....	462.20	7,597.16
1902	85,000.00	$ 5,959.97	250,000.00	....	4,256.50	5,908.69	....	2,757.57	....	20,983.07	....	....	....	224.73	11,068.69
1903	104,965.00	46,453.68	280,000.00	....	5,912.95	1,038.20	....	....	....	20,361.62	....	....	....	456.03	13,608.10
1904	104,965.00	46,439.72	315,000.00	....	5,421.90	1,013.87	....	1,894.37	....	14,299.61	....	....	....	887.16	15,072.84
1905	134,965.00	44,968.50	275,000.00	....	6,849.00	144.00	....	....	....	20,643.40	....	....	....	418.10	18,773.90
1906	144,965.00	44,987.71	250,000.00	....	8,132.35	778.48	....	....	....	14,907.36	....	....	....	319.16	17,961.67
1907	141,558.75	44,183.87	100,000.00	....	8,248.65	370.72	....	....	....	10,606.03	....	$ 892.71	....	644.05	15,999.68
1908	154,627.00	44,157.27	65,000.00	....	9,446.40	232.27	....	....	....	4,231.61	....	735.77	....	1,313.87	14,693.92
1909	162,325.00	45,971.44	10,000.00	....	9,992.75	2,860.92	....	....	....	9,734.43	....	7,340.82	....	609.56	17,168.95
1910	167,632.00	45,974.86	89,500.00	....	9,909.90	5,918.35	....	....	....	4,339.25	$ 973.90	2,036.39	....	1,021.87	20,627.77
1911	174,632.00	47,560.21	155,000.00	....	11,611.15	1,155.00	....	....	....	6,659.89	1,191.80	1,615.38	....	1,221.26	23,409.39
1912	182,365.00	46,597.08	....	....	11,838.40	40.00	....	....	....	22,750.18	1,350.03	556.94	....	1,031.55	32,109.01
1913	191,925.00	47,335.62	29,100.00	....	12,404.25	218.45	....	....	....	10,665.57	1,850.25	486.00	....	732.97	32,543.88
1914	200,000.00	46,995.53	....	$ 9,237.84	3,831.15	2,175.13	....	....	....	22,590.44	1,792.99	338.73	$3,333.33	3,541.15	28,246.42
1915	200,000.00	46,991.66	21,425.00	9,175.86	....	887.88	....	....	....	13,629.41	1,466.64	1,024.91	8,000.00	4,181.24	31,398.08
1916	197,074.35	46,996.43	....	9,599.81	....	425.30	....	....	....	13,511.12	2,193.57	1,031.47	8,000.00	1,555.12	38,339.99
1917	199,560.00	46,903.61	....	3,488.31	7,118.90	1,450.05	....	11,537.79	....	10,175.70	1,637.15	18.12	8,000.00	2,869.20	44,262.48
1918	207,586.00	48,630.71	....	2,642.70	....	48.12	....	1,580.00	$ 93.61	8,425.92	960.19	18.61	8,000.00	3,559.85	34,125.49
1919	190,000.00	45,000.00	5,000.00	4,917.84	....	....	$ 3,450.00	19,924.00	407.07	13,345.59	1,028.05	88.27	8,000.00	1,442.07	45,599.71
1920	250,098.27	53,971.48	15,000.00	17,438.28	....	5,007.00	4,095.03	5,141.92	....	32,761.08	1,654.02	263.86	8,000.00	2,517.64	51,018.20
1921	276,951.04	65,203.12	86,000.00	25,463.77	....	88,734.92	53,635.02	6,068.17	976.47	27,442.59	2,165.05	2,661.67	8,000.00	4,698.24	55,684.15
1922	264,618.05	63,341.26	25,000.00	17,060.00	....	50,888.65	16,153.03	10,074.88	3,326.28	43,047.41	3,057.91	7,191.93	8,000.00	1,765.78	58,797.69
1923	262,724.50	57,166.63	....	18,388.20	....	5,000.00	....	19,019.09	3,319.44	24,456.20	1,432.89	1,550.69	8,000.00	3,391.96	58,404.21
1924	262,471.04	57,319.20	7,970.00	16,806.00	....	....	28,233.45	28,956.34	8,097.14	11,560.62	2,013.88	942.34	8,000.00	1,938.77	76,559.41
1925	262,808.69	58,324.89	85,000.00	19,974.05	....	....	....	38,793.01	4,380.45	20,843.01	2,609.55	667.78	8,000.00	1,174.24	242,753.89
1926	273,815.12	62,266.20	1,500.00	20,402.90	....	....	....	45,467.10	7,261.21	23,460.04	2,847.35	300.32	8,000.00	562.40	87,945.27
1927	276,855.19	65,216.89	....	18,960.48	....	....	1,395.00	61,968.22	11,656.97	27,545.92	2,861.55	135.00	8,000.00	2,477.37	82,807.54
1928	319,380.50	88,109.12	....	18,106.25	....	2,480.06	....	52,676.35	10,776.84	21,004.88	2,912.97	107.89	8,000.00	4,168.15	88,794.37
1929	338,359.00	71,229.35	100,000.00	21,957.80	....	13,095.54	984.85	59,673.38	13,670.81	23,783.69	3,572.14	669.48	8,000.00	4,029.63	122,774.78
1930	350,170.92	81,343.46	50,000.00	20,834.91	....	2,500.89	375.00	65,600.39	16,966.30	17,492.92	1,355.56	639.04	10,000.00	2,726.37	134,278.88
1931	349,344.95	76,408.08	....	14,890.58	....	5,131.68	....	65,601.03	19,541.40	24,439.56	3,650.58	1,707.40	10,000.00	6,713.26	128,874.12
1932	337,490.01	76,071.24	....	16,710.25	....	1,852.40	....	61,127.48	19,155.01	20,039.28	1,934.84	335.00	10,000.00	3,607.97	97,303.32
1933	268,633.38	67,814.24	5,422.63	13,961.02	....	....	....	62,996.66	18,120.73	7,644.14	2,199.91	118.65	10,000.00	3,384.38	86,757.06
1934	257,423.08	65,806.61	....	11,025.88	....	1,037.19	....	66,502.59	18,229.23	9,267.86	1,641.06	162.86	10,000.00	606.53	81,744.26
1935	265,630.94	68,203.46	....	11,596.51	....	....	....	60,237.94	18,832.57	16,530.28	2,031.56	275.21	10,000.00	383.07	82,929.14
1936	265,057.37	68,760.95	....	13,496.42	....	100.00	....	57,270.94	17,886.45	20,918.46	2,867.50	178.43	10,000.00	470.18	79,835.73
1937	267,192.29	73,807.74	....	11,527.85	....	....	....	56,262.45	16,408.55	22,417.08	2,799.17	24.79	19,047.09	1,415.39	92,609.40
1938	282,759.71	79,225.20	....	10,235.70	....	....	....	57,043.10	13,408.11	15,351.51	558.82	....	20,455.95	431.41	93,543.59
1939	283,280.81	79,164.23	....	11,019.23	....	....	....	51,050.57	12,941.70	23,012.27	403.75	175.00	20,475.95	345.30	92,570.90
1940	282,764.15	78,905.12	....	8,392.10	....	102,343.87	....	57,543.25	12,022.76	39,627.52	577.10	....	20,069.47	533.85	98,501.09
1941	286,284.59	62,052.95	....	15,947.33	....	187,408.02	....	84,254.19	9,466.70	57,236.77	574.40	....	18,206.34	1,316.89	100,846.55
1942	258,650.76	50,931.00	....	10,169.20	....	43,088.43	....	49,226.40	4,807.79	8,369.36	553.52	....	10,762.57	401.65	144,765.21
1943	305,203.23	33,324.31	....	11,904.80	....	38,860.03	3,500.00	51,833.51	5,154.21	2,319.36	336.19	....	9,832.98	574.01	73,192.91
1944	315,787.82	33,790.82	....	17,316.09	....	32,101.60	23,420.00	50,691.82	3,717.28	5,106.59	96.48	....	10,234.06	405.52	88,594.55
1945	334,288.37	38,158.81	....	20,745.35	....	58,943.48	225.52	58,846.39	5,928.38	11,466.19	460.34	....	12,681.89	1,001.92	112,541.29
1946	366,143.74	42,654.03	....	24,688.34	....	122,388.48	°34,997.55	62,439.25	6,712.70	43,037.09	172.30	....	14,238.14	741.14	168,881.41
1947	440,147.60	40,285.04	....	22,665.64	....	104,392.80	°19,669.26	85,294.53	8,715.67	71,342.79	687.94	....	15,751.26	690.03	348,442.82
1948	469,638.83	38,564.40	....	30,690.08	....	93,683.84	116.71	83,652.16	9,419.90	26,461.29	470.63	....	16,708.48	1,004.40	346,222.76
1949	497,900.12	40,189.02	....	25,400.02	....	344,122.56	°4,203.50	82,044.22	11,170.76	50,408.80	1,370.90	....	31,251.50	1,220.47	333,543.75
1950	506,035.90	40,188.48	....	23,731.77	....	62,598.22	·	85,414.22	14,404.64	22,947.59	767.71	....	35,049.90	970.52	298,458.78
1951	553,918.55	42,774.35	....	28,913.22	....	69,747.69	....	94,063.94	12,966.97	17,934.34	613.19	....	17,936.21	1,365.34	271,570.10
1952	579,931.76	45,809.54	....	27,588.02	....	40,542.32	....	105,641.48	13,721.06	18,806.08	665.69	....	18,938.55	1,618.30	335,393.47
1953	632,546.60	45,756.46	....	27,066.78	....	218,810.05	°9,123.67	97,757.81	14,329.34	28,470.18	468.74	....	21,806.09	790.59	309,159.64
1954	639,084.84	48,606.34	....	28,008.94	....	76,808.53	°746,130.99	100,743.77	14,294.04	22,247.80	781.88	....	22,999.30	1,382.30	297,882.62
1955	650,172.61	49,049.83	....	30,615.05	....	56,213.34	°88,350.00	102,401.35	13,761.57	28,859.77	782.74	....	23,293.09	6,093.43	324,406.32
1956	738,263.33	36,516.95	....	29,900.00	....	61,385.97	°21,768.31	109,039.58	18,175.44	29,141.48	287.81	....	27,806.44	5,301.83	311,250.88
1957	784,753.54	17,703.99	....	32,804.54	....	85,464.03	°161,889.38	128,980.29	185,230.53	23,589.69	139.03	....	27,423.24	1,857.10	332,630.13
1958	798,532.65	....	....	46,659.74	....	376,298.11	°41,170.39	139,660.77	240,990.37	39,780.98	14,172.54	....	28,694.95	1,076.32	382,337.62
1959	835,272.07	....	....	68,143.83	....	83,458.41	°348,862.21	163,468.19	254,768.29	50,114.74	12,182.41	18,699.35	30,991.74	1,137.16	424,997.44
1960	871,684.49	....	....	71,415.34	....	51,626.87	°55,557.66	153,678.84	284,261.16	24,585.13	11,446.68	3,105.00	33,567.36	1,856.05	475,279.66
1961	993,091.56	10,000.00	....	56,330.35	....	75,816.23	°247,988.25	168,809.55	297,264.01	43,690.40	26,600.50	....	39,333.26	1,157.45	567,455.96
1962	1,065,315.48	35,312.94	....	62,485.03	....	89,228.94	101,788.38	175,495.68	315,587.77	74,061.29	8,174.47	....	46,407.70	1,683.33	609,257.35
Add Premium on Bonds, less Balances Reverting to the City			35,559.89												
Expended in Connection with Preparation and Publication of "A Monograph of the Pheasants" – Gift of Col. Anthony R. Kuser															194,100.00
Expended in Connection with Galapagos Expedition – Gift of Harrison Williams															98,670.00
Transfer by the Society of Endowment for Pension Fund–July 1, 1941													239,523.45		
Totals	$21,999,595.49	$ 3,001,435.60	$ 2,681,477.52	$1,090,199.94	$120,443.93	$2,905,532.27	$2,017,083.16	$3,278,408.00	$1,989,354.65	$1,438,458.51	$141,397.79	$ 56,101.81	$1,020,820.56	$104,678.73	$9,420,206.09
		$27,682,508.61		$1,210,643.87					$22,378,041.57						

° Includes expenditures in respect of new aquarium.

NEW YORK ZOOLOGICAL SOCIETY

Incorporation of the New York Zoological Society by the State of New York was accomplished under Chapter 435 of the Laws of 1895 and the basic purposes of the Society were embodied in Section 2:

> Said corporation shall have power to establish, maintain and control zoological parks, gardens, or other collections for the promotion of zoology and kindred subjects, and for the instruction and recreation of the people. Said corporation may collect, hold and expend funds for zoological research and publication, for the protection of wild animal life, and for kindred purposes, and may promote, form, and co-operate with other associations with similar purposes, and may purchase, sell, or exchange animals, plants, and specimens appropriate to the objects for which it was created.

Subsequently, at a special meeting of the Commissioners of the Sinking Fund, City of New York, held on March 24, 1897, a resolution was passed allotting South Bronx Park for the use of the New York Zoological Society and establishing the terms of a management agreement under which the Society has operated since that date, with only minor modifications.

The resolution of March 24, 1897, and the supplemental agreement of January 24, 1942, provided that the Society should furnish the original equipment of buildings and animals, that it should raise $250,000 by subscription within three years of the date of starting work on the improvement of the grounds, that the Society should have the right to establish an endowment fund to be used solely for the general uses and purposes of the Society unless otherwise specified by the donors, that the City of New York should provide funds for the maintenance and care of the Zoological Park and for the maintenance of the animal collections, that the Zoological Park should be open to the public free at least four days a week, that the Society may expend the net proceeds of facilities only for the purchase of animals and the improvement of the Zoological Park and that the Society should have the right to make and control all appointments of employees and to fix salaries and make promotions.

NEW YORK ZOOLOGICAL SOCIETY

Organized 1895

Presidents

I.	Andrew H. Green	1895 to 1897
II.	Levi P. Morton	1897 to 1909
III.	Henry Fairfield Osborn	1909 to 1925
IV.	Madison Grant	1925 to 1937
V.	W. Redmond Cross	1937 to 1940
VI.	Fairfield Osborn	1940

First Vice-presidents

I.	J. Hampton Robb	1895 to 1897
II.	Henry Fairfield Osborn	1897 to 1909
III.	Samuel Thorne	1909 to 1916
IV.	Madison Grant	1916 to 1925
V.	Frank K. Sturgis	1925 to 1932
VI.	W. Redmond Cross	1932 to 1937
VII.	Kermit Roosevelt	1937 to 1939
VIII.	Alfred Ely	1939 to 1959
IX.	Laurance S. Rockefeller	1959

Second Vice-presidents

I.	Charles E. Whitehead	1895 to 1902
II.	John L. Cadwalader	1902 to 1915
III.	Madison Grant	1915 to 1916
IV.	Frank K. Sturgis	1916 to 1925
V.	Henry D. Whiton	1925 to 1930
VI.	Kermit Roosevelt	1930 to 1937
VII.	Alfred Ely	1937 to 1939
VIII.	Laurance S. Rockefeller	1939 to 1959

Honorary Vice-president

I.	DeForest Grant	1957 to 1960

Treasurers

I.	L. V. F. Randolph	1895 to 1901
II.	Charles T. Barney	1901 to 1903
III.	Percy Rivington Pyne	1903 to 1922
IV.	Cornelius R. Agnew	1922 to 1953
V.	David H. McAlpin	1953

Secretaries

I.	Madison Grant	1895 to 1925
II.	William White Niles	1925 to 1935
III.	Fairfield Osborn	1935 to 1940
IV.	Harold J. O'Connell	1941 to 1959
V.	G. W. Merck	1959

Chairmen, Executive Committee

I.	Charles E. Whitehead	1895 to 1896
II.	Henry Fairfield Osborn	1896 to 1903
III.	Charles T. Barney	1903 to 1907
IV.	Henry Fairfield Osborn	1907 to 1909
V.	Madison Grant	1909 to 1937
VI.	W. Redmond Cross	1937 to 1940
VII.	Laurance S. Rockefeller	1940 to 1943
VIII.	Fairfield Osborn	1943 to 1945
IX.	Laurance S. Rockefeller	1945

Directors

I.	William T. Hornaday Zoological Park	1896 to 1926
II.	Charles H. Townsend New York Aquarium	1902 to 1937
III.	W. Reid Blair Zoological Park	1926 to 1940
IV.	Allyn R. Jennings Zoological Park	1940 to 1941
V.	Charles M. Breder, Jr. New York Aquarium	1937 to 1943
VI.	John Tee-Van Zoological Park	1952 to 1956
	General Director, Zoological Park & Aquarium	1956 to 1962
VII.	Christopher W. Coates New York Aquarium	1956
VIII.	James A. Oliver Zoological Park	1958 to 1959
IX.	William G. Conway Zoological Park	1961

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Supporting Members	133
Contributing Members	1,381
Annual Members	2,240
Fellows	77
Research Associates	3
Corresponding Members	4
Honorary Members	5
Total	4,316